THE ILLUSTRATED POULTRY RECORD

REARING: ARTIFICIAL AND NATURAL

EDITED BY
E.T.BROWN.

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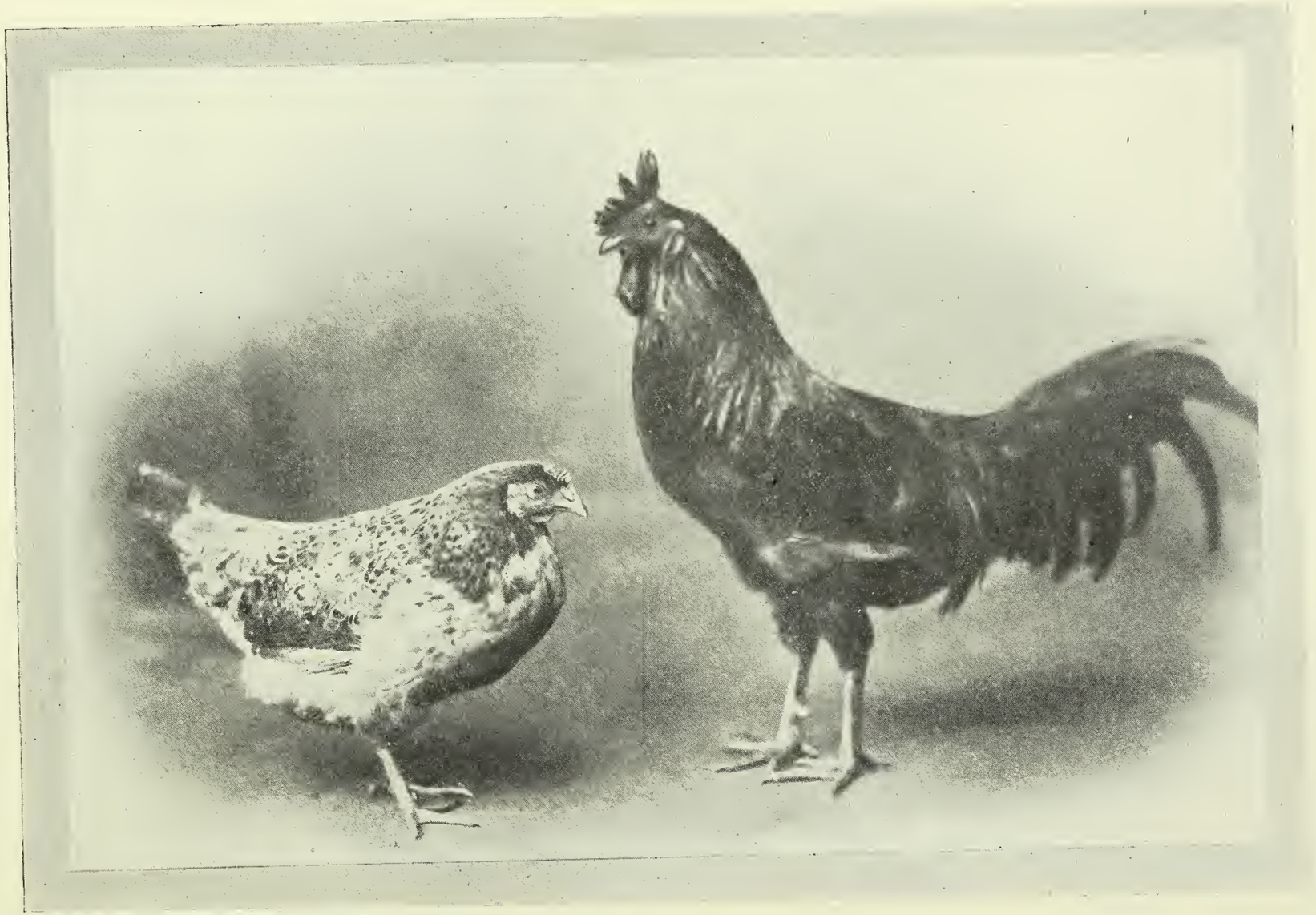
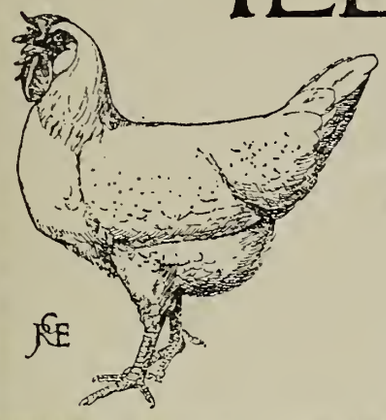
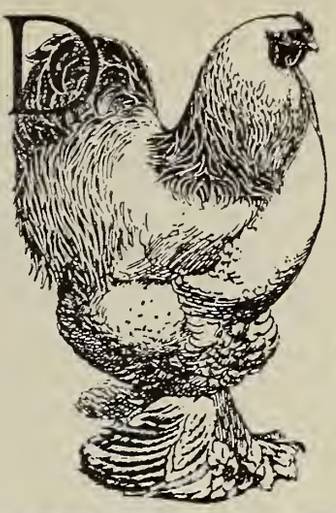


A PAIR OF SICILIAN BUTTERCUPS.

A new variety from which much is expected in the immediate future. (See page 308).

THE ILLUSTRATED POULTRY RECORD





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DIARY OF THE MONTH.

EDITORIAL NOTICES.

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The Editor will be glad to consider any MSS., photographs, or sketches submitted to him, but they should be accompanied by stamped addressed envelopes for return if unsuitable. In case of loss or injury he cannot hold himself responsible for MSS., photographs or sketches, and publication in the Illustrated Poultry Record *can alone be taken as evidence of acceptance. The name and address of the owner should be placed on the back of all pictures and MSS. All rights of reproduction and translation are reserved.*

The Editor would like to hear from readers on any Poultry Topics, and all Queries addressed to the paper will be answered by experts in the several departments. The desire is to help those who are in difficulty regarding the management of their poultry, and accordingly no charge for answering such queries is made.

The Annual subscription to the Illustrated Poultry Record *at home and abroad is 8s., including postage, except to Canada, in which case it is 7s. Cheques and P.O.O.'s should be made payable to the* Illustrated Poultry Record.

The ILLUSTRATED POULTRY RECORD is published on the first of every month. Should readers experience any difficulty in securing their copies promptly they are requested to communicate immediately with the Editor.

The latest date for receiving advertisements is the 20th of the month preceding date of issue.

The utmost care is exercised to exclude all advertisements of a doubtful character. If any reader has substantial grounds for complaint against an advertiser he is requested to communicate at once with the Editor.

Chicken Factories.

In these days of intensification we are learning much and unlearning more. Theories do not always pan out, to use an Americanism, and even practice on a small scale fails to re duplicate itself when conducted on a broader basis. The great danger, as we have previously pointed out, is failure to estimate the influence upon the birds themselves. That there is a limit to what can be done is evident. This is an old story, but one which is constantly being repeated. We are led to these observations by reading a short series of interesting articles in *Feathered Life* by Mr. T. W. Toovey, of King's Langley, which, following the article in the Illustrated Poultry Record some time ago (Vol. V. page 79, Nov. 1912), tells the results of some of his experiments. It will be remembered that we gave a brief account and photograph of the open-air shelf brooders for chicken rearing, a system which has in other hands proved a disastrous failure. In those cases, however, the birds were entirely under cover, whereas in this the fronts were partly open. The change named has not proved sufficient. Until the end of October all went well. To use Mr. Toovey's own words, "with the advent of November matters became different—the chickens went off condition, colds and roup increased, and many died." Various reasons are suggested in addition to climatic influences, such as nature of litter, want of fresh green food, etc. How far these afford an adequate explanation remains to be proved, or whether the reasons are to be found in other directions. The sum total is reached when Mr. Toovey, who is rendering great service by his practical experimental work, says: "If I had known as much as I do now, I would have only built about half the intensive plant." Such a confession speaks volumes.

The North Wales Egg Train.

We publish in the present issue a complete itinerary of the Egg and Poultry Demonstration Train which is to visit North Wales from April 23 to May 6, organised jointly by the Agricultural Organisation Society and the National Poultry Organisation Society. As will be seen, this train is to call at twenty-eight centres, at each of which the demonstration cars will be open to inspection, and a meeting will be held where English and Welsh speakers will advocate the extension of poultry-keeping by farmers and others on practical lines and apply the experience already gained in co-operative collection and sale of produce to the special condition of each district. The programme as published is remarkably complete, covering a large area of country, where the opportunities for extension of this branch of agriculture are very great. Wales ought to do very much more in the way of feeding our great industrial population than has been the case up to the present, which could not fail to add greatly to the prosperity of her people. Upon this point we hope to say more in our next issue. That is doubtless the reason which has induced the Societies concerned to select the Principality, first, for the South Wales Expedition three years ago, and now for the other part of the country. We hope, however, such efforts are not to stop there. The London and North-Western and Cambrian Railways are throwing themselves most heartily into this enterprise, which promises to be on a most complete scale, and cannot fail to exert a vast influence, not alone in the counties visited, but throughout the country.

The Educational Aspect.

One of the most satisfactory features of this enterprise, upon which the Societies already named may be warmly congratulated, is that the Aberystwyth and Bangor Colleges and the County Education Committees are cordially co-operating, and will, we understand, have representatives travelling with the party while the train is within their respective spheres of influence. This is all to the good, betokening we hope, that more attention will in the future be paid by these authorities than has been the case in the past to the giving of poultry instruction, in which direction Wales has been lamentably deficient. The Egg Train is essentially educational, bringing before farmers and others, in a way which must appeal to them, the fact that poultry and egg production is a pursuit worthy of their attention and specially suited to their conditions. It is, further, satisfactory to note that special facilities are to be afforded for elder school children to visit the cars, as in this way they may be largely influenced for days to come. It should not be forgotten that, both as to actual farmers and scholars, colleges cannot do much directly. They must be reached in other ways, and that referred to is one of the best methods we know.

The Vagaries of Fashion.

Poultry differ from nearly all other classes of farm animals in that they offer a wider choice, and the question of suitability and environment has never received a moiety of the attention it deserves. In fact, taking the country as a whole, this aspect of the case is totally ignored by the great majority of poultry-keepers. Whereas with cattle, sheep, etc., there is adherence to a local or district type, such is seldom the case, with one or two exceptions, in respect to poultry. As a consequence fashion to some extent influences individual producers in the choice of breed, and every parish may have half a score or even more of varieties kept within its confines. This is one result of the exhibition system, in which direction no harm is done, and that is equally true where the birds are kept for home or local consumption In fact, there are advantages under such conditions of variation. Such is not, however, the case where production for market is general. Then the weight of influence is in favour of such uniformity of breed as in larger stock. In an individualist country such as our own this is not easily attained, but it is an object for which to strive. Even where this can be secured it is often surprising to find that some breeds take on where others, apparently equal in respect to qualities, are neglected. This is a subject worthy of careful study.

Larger Imports.

During the entire winter months, imports of foreign eggs have shown a very considerable increase, evidently due to the fact that larger quantities were preserved last spring. The records for the first two months of the current year reveal a remarkable jump forward. In 1912 the same period were considerably below 1911, but this year the decline has not only been made up, but much more. The total figures are: 1911, 2,279,678 gt. hds.; 1912, 2,123,073 gt. hds.; 1913, 2,730,555 gt. hds.; and the values this year are £1,272,893 as against £994,833 twelve months ago. With the exception of France, there was a large increase from all countries, those from Russia, Denmark, and the Netherlands being especially great. Whether this is due to the money pressure in Germany and a decrease in demand there we are unable to say. It is evident that good prices here in January and February stimulated supplies. It will be of

interest to note how the case stands as the year advances. In poultry also there is a large increase, the figures being: 1911, £296,015; 1912, £265,745; 1913, £366,788. This is chiefly due to the United States, the values of whose shipments jumped from £30,057 in the first two months of 1912 to £135,592 this year.

Poultry in Ireland.

The *Times* is to be congratulated upon its splendid Irish supplement issued on St. Patrick's Day. It has, however, been ill-advised in its treatment of the poultry industry, which might be thought to be of no moment in respect to the developments already made, and those of the future. Out of a supplement consisting of 36 pages, less than a quarter of a column is given to this branch. When it is remembered that eggs and poultry account for 10 per cent. of Irish exports, it is evident that whoever was responsible for this otherwise valuable production was either blinded by prejudice or ignorance as to the relative facts of the case. We quote in another part of the paper the meagre sections dealing with poultry.

Clay Soil and Flesh Colour.

Mr. J. Pettipher, writing in *Farm, Field, and Fireside* calls attention to a statement made to him as to the effect of clay soil upon the flesh colour of fowls in the Cotswolds. It is said that in the place named, where sub and top soil are clay, the effect of the wet season last year was to bleach the flesh of such breeds as Rhode Island Reds, White Wyandottes, and Plymouth Rocks, whereas birds on a chalk subsoil and gravel only a mile and a half away were unaffected in this way. This is so antagonistic to previous experience that we are glad to know the subject is being investigated by a well-known scientist, and we shall await with considerable interest the result of his researches. The point which must receive attention is the nature of the clay, as there are various kinds. For instance, the Weald Clay of Sussex is totally different to the yellow clay of Essex. The former is grey, and as that is part of our great South-Eastern table poultry section, where white flesh and legs are all-important, it is evident that here are conditions of a special character. Observations have shown that there the tendency is for the legs and flesh to be bleached, though perhaps not to the same extent as on the gravel and chalk lands of Surrey. A suggestion has been made that the excessive wet last year was the cause. Whether that is so remains to be proved. What we require to know at this stage is the nature of the clay.

Fireless Incubators.

A most interesting study is that of recurrence of ideas in successive generations. While it may only be partially true that there is nothing new under the sun, at the same time much that is heralded as new is not really so, but has been tried and discarded once or twice before. Such is the case with a form of incubator which is being placed on the market under the above name. Reference to one of the articles in our February issue will reveal the fact that the first really commercial incubator made in Western Europe was that known as the "Hydro," the invention of M. Rouillier, of Gambais, France. While in that which is now put forward there are modifications, as the water appears to be in drawers, the principle would appear to be the same—namely, the obviation of lamps by replacement of boiling for the cooled water at intervals of time. What led to the adoption of self-heating incubators was the large amount of labour involved, in spite of the fact that the atmosphere is purer where there is no lamp combustion. It is in the stern light of actual experience that all such appliances have to be judged.

Smutted Wheat for Poultry Feed.

The Department of Agriculture for New South Wales gives a word of warning to suburban and other poultry-keepers who, in their desire to obtain the cheapest poultry feed, purchase smutted wheat. A case occurred recently where fowls and chickens were dying in rather large numbers, and the poultry-keepers submitted samples of the feed (grain, bran, and pollard) to the Department of Agriculture for advice on the matter. Chemical examination showed that the pollard was of inferior quality and contained smut, and that the wheat was badly infected. While no official record is known of the death of fowls through eating smutted wheat, instances have been recorded of sudden drops in the egg production. In animals, the symptoms in the few cases observed by the Bureau of Microbiology have not agreed very closely, but a paralysing effect on the centres of deglution and the spinal cord seems to be regularly present. This powerful effect has been attributed to some irritant ptomaines which develop in the plant as waste products of the fungi.

Free Distribution in Alberta.

The poultry plant on the Government Demonstration Farm at Edmonton, Alberta, is to be increased to 1,000 birds. In addition to selling day-old chicks and eggs for hatching at moderate prices, fifty male birds of laying strains are offered free to farmers, conditionally among other regulations, of selling only infertile eggs from June 1 to March 1.

CHICKEN REARING AND ITS PROBLEMS.

By Edward Brown, F.L.S.

BETWEEN the natural rearing of chickens under ordinary conditions and the process on a large scale and intensive lines there is a wide gap. Whether that will ever be fully bridged remains to be proved. Certainly such stage has not yet been reached. In many instances the results of artificial methods have proved satisfactory, more especially when the numbers congregated together are not very great. Generally speaking, however, it is freely acknowleged that in actual percentages of reared chickens to eggs used for hatching, the natural system stands out ahead of the artificial. In this connection I am not referring to small plants, where there are only one or two brooders in operation, and, as a consequence, a considerable degree of individual attention is given, but to the larger commercial undertakings where the flocks are big and there must be great concentration on a comparatively limited space. So far as these are concerned, the problem of successful rearing awaits a solution not yet reached.

Pre-natal Influences.

How far mortality in artificially hatched and raised chickens is due to pre-natal influences I do not now propose to discuss at length. That to lack of constitutional vigour in the parents, either inherent or as a result of abnormal conditions, may be attributed a large proportion of the inability to combat forced rearing can scarcely be questioned, as that something may be due to inferiority of machines as compared with hens during the process of hatching. These are questions which require further investigation ere we can claim sufficient knowledge enabling us to allocate the respective shares to the various influences at work. That these and others conduce to the result may be accepted. To suggest that they alone are responsible for losses arising under intensive conditions of rearing would be to take a very partial view. Such aspects of the question need not be enlarged upon at this time.

Natural Rearing.

Experience has abundantly proved that the natural method is *facile princeps* so far as average results and vigour of the birds grown are concerned. It is much better to accept thus much without any further question. That does not suggest that artificial rearing has not a most important place in the poultry industry. The greater its extension the more essential is it to substitute one for the other in certain directions. Hence study of the process is essential to the successful conduct of operations on these lines. That there are limitations is certain. What we require to do is to endeavour to discover what these are. It is probably true that one, at least, of the main reasons why hen brooded chicks are superior, both in the average number grown to a profitable age and the quality and vigour of the birds, is that they live during the baby-hood and infantile stages in smaller groups, that each unit receives a greater amount of individual attention, and that their environment conforms more to their needs. Apart from the fact that a hen is a living entity, with instinctive habits and actions, which probably means more than we have thought, which a brooder can never be, there is the further point that every chick receives a meed of personal attention absolutely denied to it when reared in a machine. On this score it is possible to exaggerate, but all must admit that the points here raised require consideration. Much has been said as to the evil effects of the barrack system of rearing children as compared with village homes, and those who have had any experience in these directions know that the latter are much superior to the former, not alone in respect to the happiness of the boys and girls themselves, but also as to their mental and physical development. Although, therefore, there are aspects to consider in relation to children which need not trouble us so far as chickens are concerned, yet there is a lesson which it would be foolish to ignore. We shall be wise to work from the basic principle that the natural method of rearing is the best, and that success in adoption of the artificial will be more certain the nearer we can copy the natural. Should it be that we are brought back to smaller flocks we must bow to the inevitable What must be realised is the maximum attainment in respect to number and quality of chickens reared of those hatched.

Proportionate Results.

Here it may be well to point out that the mistake is often made in expecting that all the birds produced in a flock shall be fairly equal in quality. Such cannot be. It is also the fact that the larger the number the more variable is the result. Even upon the best managed orchards the proportion of first grade fruit is comparatively small. This is not alone a question of differences in trees, but also several grades will be found upon one tree. Much may be and has been done by careful cultivation, by rigid pruning, and by removal of surplus buds, but when all that is done in the best

manner, there is still a considerable amount of difference in the size of the fruit. Such is also true with chickens, as is within the knowledge of all those who have had experience in practical rearing on a large scale. And it may be pointed out that where intensive methods are adopted this tendency is emphasised very greatly. What would appear to be the case is that any degeneracy or weakness is aggravated under the conditions named, so that such birds as might, if naturally reared, show a loss of vigour scarcely perceptible fall much below the average. This is an aspect of the case which has not been investigated, although it is of great moment. To this end what we require is a series of experiments on a large and comprehensive scale, in which chickens produced from eggs laid by the same hens and hatched in the same manner shall be divided and reared naturally and artificially, careful observation being kept all the time. Such is scarcely possible as a result of private effort, as it would involve a large amount of labour. Whenever the National Poultry Institute becomes an accomplished fact such an experiment might fitly be undertaken by it. That we must expect a number of weeds is certain. My point is that under intensive lines the tendency is towards a greater proportion of these.

INTENSIVE REARING.

Apart from all questions as to the relative results of natural and artificial methods of rearing, it cannot but be realised that the ultra-intensive methods have severe limitations, and that these systems should not be adopted for all classes of chickens, regardless of their ultimate destiny. Take, for instance, shelf-brooder rearing, which, by the way, I saw first in Germany more than twenty years ago, and which in spite of many and disastrous failures, appears to make its reappearance periodically. One of the maddest of these ventures, in which upwards of £5,000 was lost, I had something to say about in the POULTRY RECORD a couple of years ago. The wretched birds were crowded upon shelf-brooders indoors, in a close, fetid atmosphere. As a result, they died off like flies, and small wonder. In other cases, even where the conditions were much better in every way, the mortality was excessive. The fact of a few hardy birds living through such a "blackhole" period was misleading. They were the exceptions, doubtless possessed of a vitality which could scarcely be extinguished. I must confess to surprise that makers of appliances both here, in Germany and America are offering appliances of this class for sale, for the system has not succeeded even in the hands of the promoters.

A cheap and effective Shelter. Excellent for those who have to rear chickens in a cold, exposed situation. [*Copyright.*

The plan, which was tested by Mr. T. W. Toovey, as described in these columns some time ago, in which the shelf-brooders are practicially in the open air, merely under a wind and rain shelter, is acknowledged to be a failure.

What I want here strongly to emphasise is that, even if the shelf-brooder system should ultimately prove successful, and we are a long way from that as yet, it can only be used for the rearing of birds destined to an early death—that is, table chickens. With these, any degeneracy resultant from such abnormal conditions is terminated with their own lives. No permanent harm therefore accrues. To attempt rearing birds destined as breeding or laying stock would be to court disaster. That fact must be realised, and the clearer it is stated the better. For anyone to advocate such methods without making plain the limitations, is to do a serious disservice to the poultry industry, and is misleading people to their own loss.

The Question of Numbers.

It may be well here to revert to the number of birds herded together, for that is in my judgment of greater import than is generally recognised. The reasons why increase of numbers upon a given area is generally followed by greater mortality in young birds, as it is by reduced productiveness in older stock, cannot be wholly explained. Something may be done by careful management and by adoption of sanitary methods, but never, so far as I am aware, has the effect referred to been entirely overcome. It is the same with other classes of stock and human beings. Infantile mortality is always much greater in congested areas than where the population is less dense. It is not so much that the birth-rate is decreased, for the reverse is often true, but that there is a great advance in deaths. In fact, it would appear as if the one is affected by the other. Often the percentages of deaths in families, other than those of well-to-do people who can extend their accommodation as their children increase in number, is much greater where the births are more frequent than those which are smaller. So it is with chicken rearing. My own view is that the cause must be found in atmospheric influences and denial of exercise. Whatever the cause, overcrowding is never profitable.

The Atmosphere.

Cubic air space is not everything, although this cannot be ignored. Chickens brooded by a hen may not have any more air room than in a brooder. It is, however, totally different. In the first place there are only a few birds to vitiate the atmosphere, whilst if we notice how the young things nestle under the mother's wings it will be seen that one and all are able to breathe fresh, cool air. They may be protected from loss of body heat by the hen, but are not compelled to inhale warmed air. Upon this point my observations have not gone very far, and I am merely making a suggestion for careful research. In the light of long experience I have often tried to think out a brooder which

A typical American Single Comb Brown Leghorn Cock. [*Copyright.*

would give to the chicks similar conditions to those met with under a hen, but the difficulties have been insuperable up to the present. When the numbers are increased in each brooder or section the conditions are entirely changed. For instance, if in a small brooder there was a cubic foot of air space for each chicken, it is not enough to multiply the capacity by ten and place ten times as many birds therein, for the results would be totally different. It would appear that with greater numbers there must be a steadily increasing cubic air space for each inmate, whereas many poultry-keepers actually reduce it. We may assume, therefore, that mortality and loss are due in some measure to

increased numbers, as a result of which the birds are unable to secure their due quota of fresh air to breathe, and that these conditions do not prevail where, say, only a dozen or fifteen chicks form the limit in any one lot.

I have often thought that all our brooders are built upon wrong lines, and that a square or round shape is a mistake. If they were oblong and narrow, so that not more than a double row of the chicks, back to back, could get under the hover, the natural method of brooding under the hen would be more closely followed, as the chicks would be able to breathe from the outer air. If fireless brooders should fulfil their promise we shall have avoided what may be one cause of chicken mortality—namely, the living in a superheated atmosphere. Where heat is given it should be under the hover—that is, by radiation and not by diffusion, which is so general at present. Efforts should be put forth to meet what I cannot but regard as a cause of loss—namely, absence of fresh, sweet, cool air.

HEATING.

What will be the ultimate issue in regard to heated *versus* heatless brooders, and however much we may regard the last-named as preferable, except during the winter period, for some time to come heated brooders will be most largely employed. Probably we shall find that for the artificial rearing of breeding and laying stock, as that work is almost entirely after February in each year, the fireless appliance will be employed, reserving the heated brooder for raising of table chickens in the autumn and winter and for exhibition stock. Whether that is to be the development or not, time alone can prove. My immediate purpose is to suggest that in a great many cases too much heat is given—at any rate, during the daytime. It would probably be much better for the chicks if the heat were reduced by several degrees in the morning of every day, varying in accordance with the season of the year and the outer temperature, raising it again in the evening. The doing so would obviate the danger of coddling and compel the birds to go outside, instead of tempting them to remain where it is warmer. Here again, however, we need observations and experiment on an extended scale. My own feeling is that some degree of mortality is due to excessive heating. A field of inquiry is also the chamber temperature during the night, when, probably, it is always too high. Should that prove to be the case, debility and death will to some extent be accounted for in many cases.

WHAT IT ALL COMES TO.

The conclusion of the whole matter is that every effort should be put forth to overcome the weaknesses of artificial rearing. Great though the progress has been in this direction, yet the hen can beat any brooding system yet introduced. Her limitations, however, are considerable, specially by the small number of her brood. To raise a thousand chicks means the labour of nearly a hundred hens. The problem is not alone where and how to obtain the number of broody hens when and where they are wanted, but also the labour concerned. It is, therefore, a fact that we must employ artificial methods. To overcome the serious mortality which often takes place is what we are out for. That can only be accomplished by reconsideration of the whole system. It may be that we shall have to recognise that the size of each individual flock must be limited. If so we need to discern what is that limit.

I have not dealt with the question of fresh sweet soil, although that is a supremely important factor. Where smaller individual brooders are used they can easily be removed, which is not the case with buildings. I have determined that never again will I build a long range of breeding or laying houses, and, whilst it is not so serious with brooder houses as the ground outside is occupied only part of the year, my views are pretty much the same as to these.

Canadian Poultry Producers' Association.

An article in the *Canadian Poultry Review* indicates that this association has been for some time in a somnolent state. The difficulties in a widely scattered country are very great. As is usually the case, the financial question is the trouble.

The Poultry Industry in South Australia.

In his Annual Review for 1912, Mr. D. F. Laurie, speaking of table poultry, says:

"Table poultry in limited quality and of medium quality only was available for export to England. With local markets so good it is not proposed to continue the export trade for some time. If the local market continues to offer such inducements there should be a revival in table poultry breeding. In due course some of the larger plants will establish a table poultry breeding section. The small breeder with limited accommodation finds egg production easier. When it is understood that table birds can be bred for market in the long scratching shed houses just as well as those for egg production, there will be a revival. By this time every breeder should know what to breed for market, as there are so many breeds to choose from. For the export trade quality is the main point; but for the local trade any fat, heavy, young birds will command as good prices as the best. The general public is not fastidious as to quality, and, therefore, the way of the breeder is much easier."

THE RELATIVE MERITS OF NATURAL AND ARTIFICIAL REARING.

By J. W. Hurst.

THE poultry industry in this country is in a state of transition. The changes and developments of the past decade are probably incomparable with those which may be anticipated in the more or less immediate future. Successive systems and methods of production are being introduced, tested, rejected, or retained, and one particular line of progress is that of rearing by artificial means. Artificial incubation is a matter of concurrent interest, hatching and brooding being kindred subjects inextricably involved in the continuous process of production. Not so very long ago there were very many poultrymen of considerable experience who had arrived at the conclusion that incubation was much more satisfactorily achieved by the incubator than rearing was accomplished by the brooder. Subsequent modifications of methods have, however, largely tended to revive that impression. Results are now being attained that were formerly regarded as almost impossible.

It must, of course, be freely admitted that there is still much to be learnt, and many steps in improvement to be surmounted before we reach the goal. But that we shall get there, and that before very long, I have little doubt. The spirit of enterprise is abroad throughout poultrydom, and at no stage in the modern progress of the industry has there been such a promising outlook.

The subject is one of industrial economies. To keep pace with modern requirements and conditions it is necessary to find how best to reduce to a minimum the cost of production, and how best to increase and forward (in point of time) the output. It consequently follows that artificial methods must replace the natural to an increasing extent, and whatever personal opinions may be held regarding the present efficiency of the several or particular methods now in vogue, it may safely be assumed that the demand for improved appliances will result in their production. But an approximation to perfection is not reached at a bound, and I think that the eventual solution of the problems of artificial rearing will most probably be found along lines of comparative simplicity as regards the principles and construction of the appliances ultimately adopted.

The earlier means used for the saving of motherless broods have been followed by a succession of elaborate and more or less complicated methods, but there has been a recent tendency to revert to simplicity, and it would seem that the solution lies rather in that direction than the other. I am not, however, concerned with the relative merits or demerits of the several systems of mechanical brooding, because I believe that sufficient nearness to perfection for the purpose is attainable. The present object is the consideration of the relative advantages of the natural and artificial methods.

Whilst there are several reasons for regarding the hen-mother more favourably than the foster-mother, there are important points of view from which the former appears very insignificant by comparison with the latter. For those whose requirements necessitate a more particular production, for stock or other purposes, or for those whose needs are limited to the rearing of a few broods every year, there are strong arguments in favour of the use of hens. But for those who must deal with production upon an industrial basis, the balance is on the side of mechanical appliances. Up to a certain point the appliances, both for incubation and brooding, may be regarded as adjuncts to the natural method. Many of us, indeed, have preferred to regard them in that light as long as possible. But, while for a certain class of poultry keepers the machines may continue to occupy that relative position, we must recognise the fact that the time has arrived when it is necessary to take a wider view of the general progress of events.

We are in an era of considerably extended incubator capacity; not only are these appliances multiplying in agreement with a growing demand, but their individual capacity is being enormously enlarged. This tendency necessitates a corresponding increase in the use of brooding appliances to do the work that has far outgrown the capabilities of hens. In the poultry industry, as in so many others, the introduction and development of mechanical methods results in widespread modifications of existing systems, and, as the newer methods are improved and completed, so are producers eventually brought into line under the compulsion of economic law. From the commercial point of view it is almost too late in the day to discuss the relative merits of natural and artificial means of rearing. However much we may be inclined to prefer the one, modern exigencies oblige us to accept and adopt the other. Except for comparatively limited needs no commencing producer would now-a-days contemplate the conduct of operations upon other than an artificial basis.

In the marketable chicken trade the unit of production is comparatively insignificant, and the margin of profit is small. To make such a production of any individual importance as a means of living, or as a serious contribution to that end, the output must be upon a large scale. Not only so, but the course of the market must be carefully studied and the production as carefully regulated, otherwise the periods of more remunerative returns are probably mixed, and the annual average is not maintained at a sufficiently high level. The more these necessities are realised the more evident it becomes that the hen is not a sufficient means to the desired end. Without the use of brooding

appliances (and, by implication of incubators) it is as impossible to produce the required numbers as it is to obtain them at the desired seasons in due proportion.

It is, of course, inevitable that brooding appliances should have their limitations, and, however these may be improved and removed, the human factor must remain, and the responsibility rests ultimately with the operator. The larger the operations, the greater the risk of loss in proportion to the over-estimation of the powers of artificial mothering contrivances. It may in fact be said that the human factor is the essence of the difference between the natural and the artificial methods, and that the advantages accruing from the use of brooding appliances are largely proportionate to the skill and experience of their operator.

It is the ever-readiness and practically limitless capacity of the artificial methods that constitute the chief merits, and claim the more particular attention of those whose operations are in any sufficient measure commercial in character and extent.

On the other hand, the hen as a mother is very meritorious, and although her scope may be too limited for the larger modern schemes of production, her services are likely to remain indispensable for some purposes. For a small production the balance of advantage is in favour of the hen, and will almost certainly remain so until a system of co-operative hatching encourages the adoption of other methods by small poultry keepers. Nothing can be better than a good hen mother as regards the actual work of rearing and the results she obtains. But she is at a disadvantage when the requirements of production are hampered by her limitations. Within her limitations she relieves the poultry keeper of a great deal of responsibility, rears her chickens on a good range for foraging at a minimum cost, and—the method being generally more natural—the birds she rears are distinctly preferable for some purposes. Nevertheless, she is sometimes "uncertain, coy, and hard to please" and when such is her temperament the results are apt to be disastrous, but when all has been said for and against both methods, the adoption of either depends ultimately upon the relation of limitations and requirements.

THE SEVEN PHASES OF THE POULTRY INDUSTRY.

By Wilfrid H. G. Ewart.

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III.—SMALL HOLDINGS.

JUST as in the case of farmer and cottager we think of the past and all its futilities and all its mistakes, so in the case of the smallholder we look to the future for emancipation. There is much that may be vital to the poultry industry in the spreading over England of a land system dependent upon the individual and supported doubtless by a bold and forward peasantry. The public egg-market with its certain returns and Leadenhall with its wide possibilities of profit are not likely to be disregarded by such a body. They are too obviously a source of income to be neglected in a machinery which depends for its vitality upon interaction, reaction, and the most particular economy. If smallholders are to succeed they must develop the utmost capacity of their poultry just as also of their pigs and bees. And it is here that doubts arise as to the ultimate success of a scheme which demands not only versatility and diverse abilities in the individual, but commercial aptitude and expansion as well.

Co-operation.

There is co-operation without which the best economy becomes destructive and hopeless extravagance, a fatal barrier to success. And co-operation means much: it means a collective disposal of produce for purposes alike of economy and increased remuneration. It means a collective purchasing power offering the immense advantages of the large consignment. It entails certainly the establishment of a depot or headquarters whence may be lent and circulated, and where may be developed the sinews of industry. It entails a free comradeship and exchange of information between man and man. It involves financial as well as material interests, and, finally, it means technical combination in a skilled sense between cows and pigs, bees and fruit, etc., as already instanced. Nor will it be of great advantage to the smallholder however highly skilled as a poultry-keeper unless he can take advantage of these various considerations for there seems little to be gained by producing that which cannot profitably be sold. Under present circumstances the early ducklings, incubator-hatched, milk fed and diligently grown up to the eighth or tenth week—plump withal and readily saleable — bring, too often, an inadequate, and when all things are considered, scarcely economic return to the rearer. That is why some people continue sceptically to ask: "Does poultry pay?"

The Keynote.

The keynote of poultry-keeping on smallholdings, therefore, is co-operation, whether productive or commercial, and in the former

sort I would emphasise the importance of fruit-culture. Nearly all the wiser and larger poultry-farmers in the country to-day are planting fruit where it has not been before, not so much in the light of a commercial speculation as because of its peculiar benefit to the fowls. For these there is natural shade through the summer, shelter in winter, while insect life abounds. As soon as the trees are planted the birds can be run on the land and within a very few months the benefits of this measure become apparent. Earwigs, maggots, and fly disappear as though by magic while there comes a noticeably finer growth on the land, a sturdier type of tree. In passing through fruit-runs I have frequently remarked upon the greater development of those near the entrance where the birds were usually fed, and these at the further end. The extra manure, of course, accounted for this difference. The best approved plan of running poultry in connection with fruit is to divide the land up into half-acre pens with a grass ride down the centre. The latter is convenient for feeding, after which the birds will always find their way back into their respective pens. Nor need the wire-netting fences be so high as on an open poultry farm, for in fruit-planted runs there does not seem to be the same temptation or inclination to jump over. It is only for a short time while the fruit is ripening or falling that the fowls must be removed from their runs though of course the latter must have at least a three months' rest in the year.

Cows and Pigs.

That rearer, especially of table chickens, is at an immense advantage who keeps a cow. I have often advocated the *petit poussin* trade for smallholders because if the right market be sought there is unquestionably a large demand for this class of produce in any good neighbourhood. Almost a *sine qua non*, however, for early table birds is plenty of milk in one shape or another, and skim-milk is the very thing. Skim made up with sharps and Scotch oatmeal represents something like the perfect mash, light and silky, while superfluous moisture is worked out. Pigs are not so obviously accessory to the feathered department, but they are nevertheless an important economic factor in the general scheme. Anybody knows this who has been in the position of buying large quantities of meal at a time after habitually dealing in small quantities—the books tell the tale. Pigs help out because their own needs largely partake of those of the poultry. Litter which has been cleared out of the poultry-houses can well be thrown over into the pigstye and other means soon suggest themselves by which mutual economies can be effected.

Poultry on a Small Holding. [*Copyright.*

A Board of Agriculture Experiment.

Apart from this matter of the relationship between the poultry and other departments of the small holding, the experiments in the intensive rearing of table poultry now being carried on in Cheshire under the auspices of the Board

of Agriculture are of wide interest to smallholders. We are told that upon 3½ acres 2,000 chickens were reared at a net profit of £100, while it is hoped considerably to enlarge the

Among the fruit trees. [*Copyright.*

There is no better place for poultry than an orchard. Not only do the fowls thrive excellently, but the trees benefit by the manure.

experiment with a proportionate increase in profits. While this instance quoted from the "Journal of the Board of Agriculture" discloses certain peculiar and exceptional circumstances and while one cannot take an altogether sanguine view of such highly intensive culture, still the experiment conveys an important lesson. On a larger acreage, the same handsome return should be possible with less risk and upon a somewhat different scale. Principally, however, the question is raised of egg-production and table poultry on small holdings. Could we look upon intensive table poultry production as a generally applicable system, we might feel sure of its being the smallholder's special line. But I do not believe the average man who works a ten or fifteen-acre plot will ever specialise, or specialise capably, in any peculiar phase of any particular department. We shall always find the flock of layers and the growing chickens on the one hand; and on the other the superfluous cockerels sold for table purposes. The average smallholder is too busy, overmuch inculcated with general principles to elaborate any phase of his work. In the same way his interest lies for the most part in the purely marketable aspects of the poultry business, *i.e.*, he is not a man who will advertise his pure-bred stock or attempt to obtain inflated prices for it. One of the troubles (and curiosities) encountered among smallholders at the present time is their disposition to cart their produce to the handiest market though it be the least profitable. Men will haggle for hours over any trivial private deal, but when it comes to selling a long hundred of new-laid eggs upon which they depend for their livelihood, they will accept the first offer or take them to any market that presents itself.

FUTURE NEEDS.

There is little progressive business instinct here nor ever will be, I conceive in the average smallholder. It will always be necessary to dispose of produce collectively through some central and responsible authority. We have all heard of Street and Framlingham, and the good work going forward at those places; yet the cause of co-operation must be carried further still. I speak not of land banks, the reserve fund, or of essential capital here. But at a time when the price of foodstuffs is an obstacle to economic poultry-keeping, the question of economy in this direction assumes importance. The central depot should have large purchasing power as regards foodstuffs for disposal to its members, and this, apart from the operations of the incubating and fattening station.

THE CONTRIBUTION OF POULTRY HUSBANDRY TO THE SCIENCE OF GENETICS.

By Dr. Raymond Pearl.

It has been said by Pawlow, the eminent Russian physiologist and surgeon, that we are indebted for each real and fundamental advance in our knowledge of the laws of nature to the invention of some new technique—some new way of attacking old problems. To the geneticist "technique" implies not only methods but material. He must constantly be on the look-out for forms of animal and plant life which will afford suitable and favourable material with which to attack particular problems of inheritance. The number of such favourable forms is surprisingly small, when all such factors as availability, adaptability to experimental conditions, expense involved, care needed, etc., to say nothing of the special biological requisites for particular lines of work, are taken into account. Of the vast number of species of plants and animals which people the surface of this earth, only relatively few can, for one reason or another, be made use of by the experimental breeder.

Of all the domestic animals the fowl easily occupies the foremost place as a favourable object for genetic research. Poultry offers the geneticist a long list of advantages. The ease with which all kinds of fowls may be bred in large numbers; the independence with which they shift for themselves; their economy; the wide range of sharply differentiated characters exhibited in the different breeds and varieties; all these things and many more combine to give poultry a most important place in the experimentalist's resources.

In this way, as the material for research the domestic fowl has played its part, which is none the less an essential one even though it be a humble one, in the establishing of some of the fundamental principles of biology.

The developing chick may fairly be said to have been one of the corner stones on which the science of embryology has been built. If we go back into the seventeenth and eighteenth centuries and read the works of the founders of embryology, William Harvey, Marcello Malpighi, Charles Bonnet, Friedrich Kaspar Wolff and Karl Ernst von Baer, we shall find that the inspiration for their life work came in no small measure from the contemplation of the wonderful series of changes which goes on in the hen's egg during incubation.

But to confine our attention directly to the science of genetics or brooding the position of poultry is no less honourable. In building up his theory of evolution, which profoundly changed the world's intellectual outlook and methods, Darwin drew very largely for evidence upon the store of facts regarding variation and the production of new organic types which had been accumulated by the practical breeders of domestic animals. Nowhere did he find a more fruitful source of such evidences than in the creations of the poultryman, the breeds and varieties of the domestic fowl. One has but to turn the pages of "Animals and Plants," or the "Descent of Man" to be impressed for example, by the frequency with which Darwin turned for facts, for suggestions and even for advice about experiments, to that distinguished poultryman, W. B. Tegetmeier, whose death a few months ago removed the last of the three men who are perhaps the most distinguished in the history of poultry husbandry. Harrison Weir, Louis Vander Snickt and W. B. Tegetmeier were not merely great poultrymen; they were true naturalists as well. Poultrymen may well do them honor.

In recent years the services of poultry husbandry to genetics have been particularly conspicuous. Following the re-discovery of the work of Gregor Mendel on the mode of inheritance of characters in plants, at the beginning of the present century, there was naturally excited a great degree of interest as to whether the same principles held for animals. Practically the first animal forms subjected to experimental inquiry in order to test the matter were poultry. The English students of genetics, Professor William Bateson and Professor R. C. Punnett, of Cambridge University, undertook experiments with fowls among their earliest researches in this field. Their results demonstrated the fact that Mendel's laws actually do hold for animal forms. Their investigations with poultry, which are being continued at the present time, have served to establish some of the fundamental principles of heredity. The pioneer genetic researches of these workers were soon followed in this country by the studies of Dr. C. B. Davenport with poultry at the Carnegie Institution's Station for Experimental Evolution.

One result of genetic research with poultry as material deserves special mention. The domestic fowl was the first vertebrate animal for which the principle of sex-linked inheritance was demonstrated. The mode of inheritance of the colour pattern of the Barred Plymouth

Rock fowl, first suggested on theoretical grounds by Spillman, and subsequently demonstrated from experimental breeding evidenced by Goodale, Morgan and others, will long stand as one of the classic examples of sex-linked inheritance. The significance, both theoretical and practical, of this type of inheritance cannot as yet be fully estimated. Every day is bringing forward new evidence of its generality, both in respect to the different animal and plant forms in which it obtains, and in respect to the different characters to which it applies. That it is a matter which concerns the practical breeder is indicated by the fact that the only productive character of any animal of which the precise mode of inheritance is known, has been shown to be sex-linked.

It is clear that the science of genetics is indebted in no insignificant manner to poultry husbandry. It is the hope of the geneticist that he may be able, through the results of his investigations, in some degree to discharge the obligation by giving to the poultryman a store of definite and precise knowledge of the laws of inheritance, to take the place of mysticism and empiricism in the breeding of poultry.

Poultry Pens on a Smallholding in Kent. **(see page 297)** [*Copyright.*

British Columbia and Egg Supplies.

It is stated that New Zealand has been sending trial lots of eggs to British Columbia, where the shortage appears to be greater than ever, and with most satisfactory results as to quality and prices. The merchants are asking for larger shipments.

UTILITY POULTRY CLUB.

Twelve Months Laying Competition.

The fourth report of Mr. F. W. Rhodes, who is managing this Competition at the Harper Adams Agricultural College, has just come to hand.

The report covers the fourth period of four weeks from the 8th January to 4th February, and draws attention to many interesting features of the competition.

In spite of damp, foggy weather during a large period of the month, the egg yield shows an increase of 917 eggs over the preceeding month, making a total of 6,760 eggs for the month.

The pen records and individual records for the month are worth noting. The highest pen record is 121 eggs by a pen of White Wyandottes. This means an average of over 20 eggs during the 28 days from each of the six birds comprising the pen, no mean record. The highest individual record is that of a Buff Orpington pullet, laying 25 eggs during the 28 days. One is glad to see however in these Competitions the average yield per pen rising rather than large individual records.

A pen of Red Sussex are occupying the eleventh place. It is interesting to see a strain of this breed coming to the fore. We do not recollect seeing this breed attain such a high position in previous Competitions. It will be interesting to note where they will finish at the end of the twelve months.

Buff Plymouth Rocks still keep their lead with a total of 362 eggs, (value £2 12s. 8½d.), to the end of the fourth month. They are followed by three pens of White Wyandottes. The following Table shows the position and scores of the leading pens:—

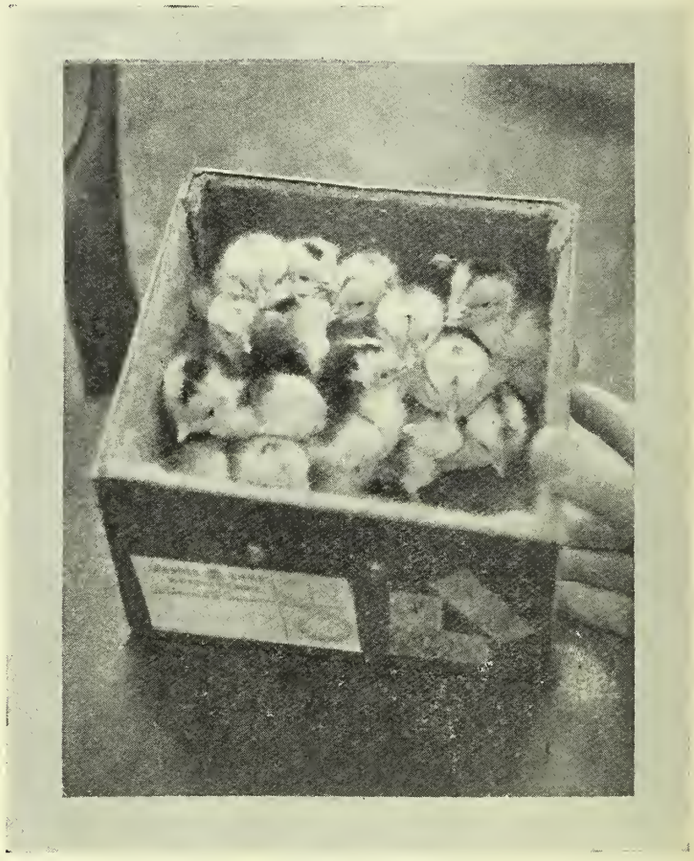
Position.	Pen No.	Breed.	Total Eggs during 16 weeks.	Total Value. £	s.	d.
1.	86.	Buff Rocks.	362	2	12	8½
2.	60.	White Wyandottes.	350	2	7	4½
3.	32.	White Wyandottes.	314	2	1	10¾
4.	45.	White Wyandottes.	309	1	19	3
5.	24.	Black Leghorns.	272	1	17	4½
6.	80.	Buff Orpingtons.	270	1	16	7½

THE SALE OF BABY CHICKS.

THE growth of what we call the "day-old chick" trade within the last few years has been phenomenal. We cannot, in Europe, show such figures as are recorded for some American establishments. Breeders in the United States were slower in taking up this branch of poultry culture, but with that instinctive desire for large operations which there touches every side of life, and with the vast development of the industry, they now record a greater magnitude of sales and bigger plants.

As a matter of history the trade in Britain does not, with the exceptions noted later, go back more than twenty years, although known previously on a modest scale in France. About the time named there were several establishments in the Seine-et-Oise Department where hatching for farmers and others was conducted, and the sale of day old chickens made an important feature. At once it was realised that here were two developments which might be adopted with great advantage, namely, that of hatching stations so that farmers might avail themselves of a supply of chickens at almost any season, and yet avoid the necessity for buying machines, at the same time obtaining the services of expert operators at a moderate cost. On the other hand, they would be able to buy baby chicks, so as to obviate the many disappointments inseparable in bringing from a distance eggs for hatching, which is often unsatisfactory alike to the vendor and the purchaser. There is probably no branch of the poultry industry in which is greater chicanery than in the sale of eggs for hatching; and, further, our experience has been that travelled eggs seldom hatch as well as those incubated on the place of production. The delicate mechanism of the contents of an egg is influenced adversely by jars and shocks inseparable from a journey by rail. That something was necessary had been apparent to many of us.

Of these two systems, strange to say, the former did not find any favour practically, although it was generally approved theroretically. Why that should be so has never been fully explained, but such are the facts of the case. Of late, signs have been manifest that this side is likely to be more generally adopted. At one or two places a start has been made and with marked success, but these are on, as yet, a modest scale. Still a beginning has been made, and the advantages would be so considerable that we hope growth will be much more rapid in the future. Probably one explanation is to be found in the fact of the great diversity of breeds met with in almost every district. In France the plan was general of delivering two chicks for three eggs brought in. There was no guarantee given that the former would be from the latter. As practically all the birds in the immediate district, however, were of the same breed or type, it was of minor importance, and might be in some respect beneficial, giving a measure of fresh blood. Such would be useless here. If a man took in White Leghorn eggs he wanted White Leghorn chickens, and so on. To keep each batch separate would add enormously to the labour. Perhaps that explains the slower progress made.



Ready for Dispatch. [*Copyright.*

On the other hand the day-old chick trade caught on at once, and has grown to very large proportions. Hundreds of thousands of these little birds are sold annually, and some of the best breeders have entirely abandoned the sale of eggs for hatching. From the purchasers point of view the gain is very great. Instead of paying money for the sporting chance of getting chicks, and running the risk of having all the expense and labour of incubating the eggs for three or four weeks wasted, living chicks are purchased when and of the kind required. That

is an important gain, which has been greatly appreciated, although perhaps the purchasers have mainly been among smaller poultrymen, who have found it preferable to buy chicks from fowls kept under natural and healthy conditions, rather than hatch from eggs laid by their own birds, the latter possibly being kept in small runs. Farmers, however, are now beginning to realise the value of this system, and when they fully appreciate its usefulness the trade will assume much larger proportions.

At first there was very natural hesitation as to whether such young birds would be able to stand the journey. Any fears there were in that direction were soon dispelled by actual proof, which is ever the better test. One of the early experiments was to send a batch of chicks from Ireland to Berlin, involving a thirty-six hours journey, with two cross-seas shipments. All the birds arrived in strong, healthy condition, after which with our shorter distances there was no occasion for fear. The natural first food of these birds is found in the yolk-sac, and the contents are enough for at least three days. Mother Nature always provides for the first stage of separate life in all animals. Thus the way was open, and many breeders began to develop a trade which at one time was undreamt-of. It, however, taught a further lesson which has not yet been fully learnt, namely, that applied heat, even during the first few days of a chicken's life is not necessary to the extent imagined, so long as their own body warmth is conserved. That is now being recognised in respect to Fireless brooders. The inner compartment of the last named is pretty much the same in principle as the day-old chick box. We have much to unlearn as well as to learn in connection with poultry, of which this is an example. There may be many other directions in which the same is true. Deprivation of heat was entirely antagonistic to all our preconceived notions, and there were few who imagined that during the infantile period a chick could dispense entirely with applied heat. The general opinion in all countries has been that a hen gives warmth to her brood. That would not appear to be the case, and that she merely protects them against elimination of body warmth, as does the human mother when she wraps her baby in a blanket. How many millions of chickens have succumbed in brooders, victims of false ideas, cannot be told.

It is interesting in this connexion to make mention of an old custom in several English counties, and upon the Continent of Europe, namely, the sale of a hen and her brood in one lot. In some of our markets during April, May, and June, more especially the two latter, may be seen baskets containing a hen and ten or a dozen youngsters, selling at from 6s. to 10s. the lot. That has been practiced for many years. 'Cute hen-wives get rid of their older hens in this way. Such system differs from the newer method, for, as a rule, there is no definate breed in the chicks, which are often merely mongrels, and frequently so far mixed that no one can discern what they are in respect to breed.

What appears to be an essential factor is that chicks which are to be sent away as day-olds, shall be hatched from eggs laid by hardy, vigorous hens, kept under fairly natural conditions. Highly bred stock, or those which are in limited runs, are not suitable for this purpose, as the young birds have not the requisite constitutional vigour. It is interesting to mention in this connexion that eggs from such fine-bred fowls do not give the same results when sold for hatching as those obtained from hens of a hardier type, and, further, that it is always wiser to hatch and rear birds from highly or closely bred stock by natural means, rather than by artificial. Perhaps this may to some extent explain the great mortality among incubator and brooder chickens on many plants, as these appear to be less able to withstand the attacks of bacilli of various forms. Hence we find that some of the largest and most successful vendors of day-old chicks live in the more exposed, hilly sections of the country, where their birds are exposed to winds from "a' the airts." There the hens are distributed over the hill-sides at perfect liberty or are kept in very large runs, generally the former, with the result as stated. Some attempts have been made to conduct this business on other lines, but without the same satisfaction to either the breeder or his customers. One man who does not keep his own breeding stock but buys all his eggs for hatching, informs us that he has been compelled to organise a supply from farmers whose conditions approximate to what has already been named, and that unless the eggs are from virile, active stock, kept in a natural manner the average hatching is low and the mortality in the chicks considerable. In some instances no ill effects were found for one or two seasons, but later, when the restricted influences had accumulated in the stock birds, a change had to be made. Therefore, stress may be laid upon this point.

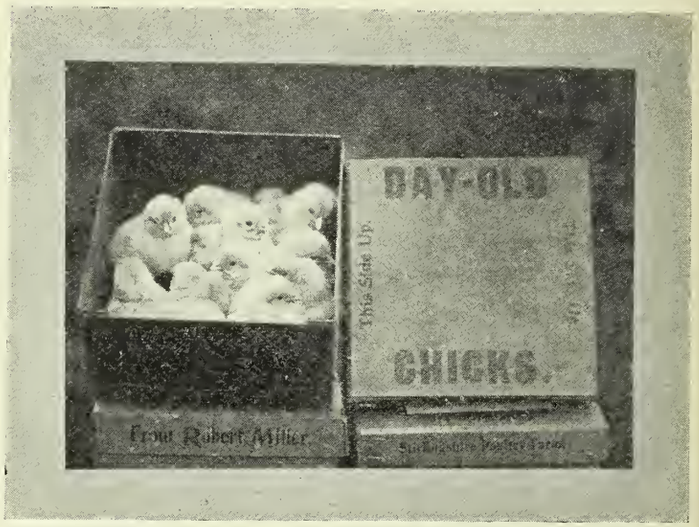
It has been found, also, that some breeds travel better in the day-old stage than do others.

Most of the laying races, such as the Leghorns, &c., and the General Purpose breeds, like the Americans, stand the journey exceeding well, provided they are from hardy parents. There would be many advantages if this system could become general for the table beeeds known on this side, like the Dorkings, but as yet it is not so, mainly by reason of the fact that these table breeds are naturally less vigorous than the others. It would appear to be entirely a question of constitution, and the less precocious races seem not to be so adapted as are those which depend upon their own exertions at an earlier age. Perhaps this may be overcome in process of time, or the truth may be that they should not be dispatched quite so soon.

The customary plan is to dispatch the birds as soon as they are dried off after hatching, by which time they have got fairly upon their feet That is usually twenty-four to thirty-six hours after emergence from the shell. As already stated they bear the transit much better than will be the case when they are older. Where, however, the journey is to be a long one, many of those engaged in this trade scatter a few seeds in the box, so that if the birds feel hungry a supply of food is available. We recently came across an instance showing the remarkable vitality of young chicks. A lot of fifty were sent a cross-country journey which should have taken about twelve hours. By a mistake in the address the consignee could not be found by the Railway Company, and they had to be returned to the sender, reaching him about three days after dispatch, so that they had been nearly four days without food after hatching, and it was by no means kindly weather. Yet they were as lively as could be, aud had suffered no harm. Such is a reflection upon many of our previous ideas and anxieties to induce chickens to eat as soon as possible, even to the extent of tempting them by dainties. Such evidence supports what the late Louis Vander Sniekt, of Brussels, frequently said, namely, that strong chickens should have no supplied food for *at least* three days after hatching. It, however, proved something more, that if they are protected against cold, artificial heat is unnecessary even at this early age.

Experience has, also shown that the number of chicks packed in one box should not exceed two dozen, as there is less danger of overcrowding and injury should the box be turned on one side, as may often be the case. They appear to have an instinctive tenderness for these young birds, and we have several times seen at junction stations where there was a wait for connections the men put them under cover, which thoughtfulness deserves recognition. It is customary to use a prominent label stating what are contained in the boxes, and a cord handle on top assists greatly.

The boxes used are very simple, either of half-inch or five-eighths wood, or even of card board, with holes for ventilation all round near the top of the sides. More harm results from denial of this element than even a little exposure, though the latter is not desirable. If the chicks are kept for several hours in a fœtid atmosphere they are bound to suffer. A box to hold twenty-four birds should be about a foot square and five inches deep. The bottom is covered with an inch or two of cut chaff, that is, cut straw, in which the birds can bed themselves. Before the lid is tied on (it should not be nailed), a piece of soft flannel should be fixed loosely to sag enough so that the birds can get their back against it, and a handful of hay on top will give it a resistance to pressure from them. In very cold weather an excellent plan is to line the sides with flannel, as that material will allow air to pass through. In France more elaborate boxes are used, some of which are fitted with food troughs in front, but we have not found such an arrangement at all necessary.



Packed for the Journey. [*Copyright.*
Showing an excellent way of dispatching day-old chickens.

The card board box shown in the photograph is thickly lined, walls, lid and bottom, with felting, leaving a ventilation hole at either end.

Some breeders have taken up recently the sale of Turkey chickens and with marked success. As artificial rearing has not proved desirable for these birds, the plan adopted is to sell an ordinary broody hen (fowl) with them. The mother and brood are placed in a roomy hamper or basket, well bedded with straw, and as the hen gives all the shelter and protection needed, nothing more is required than to fasten on the lid securely, and attach a direction label. There appear to be great possibilities in this trade.

THE VALUE OF FANCY POINTS.

IT is always rather a debated point as to what should and what should not be considered of prime importance in a show bird; also, as to what method should be pursued by a judge in assorting his classes. We all know—at least, those of us who have been in the Fancy for any length of time—that judges of poultry differ in their ideas to a rather remarkable extent; that some have fads and that others are most particularly anxious to abide by the official standards. The official standards are tolerably elastic, and if a gentleman chooses, he may interpret them according to his own sweet will. So we find that there are people—usually discontented people—who strongly recommend the use of a score-card and a pencil after the American fashion. Possibly the merits of this system are not very great—a man gets tired of working it at a good-sized show. Still, it has its advantages.

Now, as regards the comparative value of fancy points, would not a system of scoring tend to bring those values rather more into line? The scores of the different birds in "the money" would, I imagine, be ticketed on their respective pens; and a judge would conceivably be far less inclined to place his faddist's value on a certain point if his fad had to be disclosed on a score-card—a disproportionate award of points might bring him a caution from the Poultry Club. You see, these partialities are not quite good for competition and the Fancy in general. They are not fair. In course of time a judge's strong predeliction for head points in any breed would become well known, and it is a recognised fact that the bird with the good head will win its class. Judged strictly according to standard, this particular bird might deserve at best third prize. Whereas the standard names fifteen points for comb, etc., the individual judge may, perhaps, place twice this value on the same characteristic. We all take note of these predilections—of course we do—and a certain bird is sent to suit a certain judge. It is perfectly natural. The objection is that under such circumstances the best all-round exhibit does not always win.

Often and often I have listened to discussions about the comparative values of type, colour or markings, and size. It is odd—very odd—how people absolutely disagree on such an important matter. I find that the majority consider type the main thing, a great many go for colour and markings, and a certain number stand out for size. Of course, we all know what the tendency of a breed or variety is—to which extremity it is bred. But that is not the point. There is a great deal of follow-my-leader business about the development of a variety; and because pencilling invariably takes precedence of shape in the show-pen, I do not think it altogether follows that the majority consider pencilling the more desirable point. This rather brings us back to the peculiarities of judges. Pencilling may have been made the great feature in the winners at a classic show, and thereafter people will neglect shape and go for this other point. So a rage arises, a boom in well-pencilled birds; and the great majority of judges will drift in the same direction because it is understood to be the right thing.

To return to the question of this comparative value of type and colour or markings, it seems to me clear enough that the former should be the prime consideration in any breed. After all, type is the breed, colour common to many races, and marking the distinguishing feature between varieties. We have a White Orpington and a White La Bresse side by side, and practically the only difference between them is in type. We see some Gold and Silver Wyandottes which are not Wyandottes at all; and a great many Buff Orpingtons which are not Orpingtons. For the latter there is great excuse, but when one conjures up the beauty of Wyandotte type one wonders that two of the family should flaunt it. In many ways this Gold and Silver Fancy resembles the Plymouth Rock Fancy; and perhaps similar causes are at work in both cases.

If you refer the question of type, colour or markings, and size to any recognised judge, he will always declare for one of the first three and never for size. Yet I firmly believe that in many breeds, so far as the winning of prizes is concerned, size is the most valuable asset to have on one's side. Though an all-round judge, when he says he goes for type in the first place, is doubtless speaking in perfectly good faith, I doubt whether he actually does. With a man who has a characteristic fad it is different, but in the case of a judge who has to work through a whole show, I have always found size to be of very great value. He (the judge) goes along the row of pens, and the big, massive Wyandotte or Orpington pulls him up at once. It may be a coarse bird of moderate shape and colour, but as often as not it will beat another that is full of quality—when carefully weighed up—and does, in fact, win the class according to standard points. Somehow, size does make a tremendous difference, and, in my opinion, the actual value of a really good specimen that fails in this respect is just about halved.

In a way, the contentions of the few people who place size before everything are justified. When a general tendency towards decrease in size is noticed in a breed, it often happens that that breed degenerates from every point of view. It declines in popularity, and, of course, this is the most serious danger that can confront it.

Eggs in Argentina.

Eggs are scarce in Argentina, and the prices sometimes rule high. At other times the imported supplies keep down the price of eggs in that country. A recent consignment of 20,000 dozen eggs was sold at only 32 c. (6½d.) per dozen. Preserved eggs cannot, however, be disposed of as new laid eggs, but even the latter are being sold wholesale at only 40 c. (8d.) per dozen; in the capital they are retailed at 1s. 9d. per dozen.

FOUR USEFUL COOPS.

There is nothing very difficult about the construction of a coop, but it is necessary to have a good idea of the most suitable proportions before commencing work. In the page of illustrations opposite four different types are given; all of them are equally good. No. 1 represents what is probably the most common type. No. 2 is built to the same dimensions, but it has a removable top and a sliding front. No. 3 is a new design for a collapsible coop; it is very similar to the first, but the sides are so arranged that the whole may be taken apart and packed away quite flat. No. 4 is also a well-known type, and is very easily made.

Coop No. 1.—This is made of odd boards $\frac{3}{4}$in. thick, the two sides as illustrated at *a* are composed of upright lengths nailed to cross pieces of the same material. The length is 22ins., height in front 24ins., and at the back 16ins. The back as indicated at *b*, is similarly made, using boards 24$\frac{1}{2}$ins. in length, nailed on to battens each 16ins. long. The sides are nailed to the back, and in front a batten is let in the base, as shown in the side view, and nailed in place. The front is composed of five upright strips, these are nailed to the front of the bottom batten and to a length of board at the top; this piece of board being about 4ins. wide and nailed in place from the sides. The two outside uprights are about 3ins. and the inner ones about 2$\frac{1}{2}$ins. The middle upright is attached to a strip of 1$\frac{1}{2}$in. by $\frac{3}{4}$in. wood as indicated at *c*, and slides up and down through a slot cut in the front roof board, and kept in position by means of the strip of wood indicated at *s*. The roof is composed of ordinary feather edge boards nailed on the sides and overlapping on all edges.

Coop No. 2.—The sides of this coop are made in the same way as No. 1 coop, but the battens are inside instead of outside. The back is exactly the same, but in order to allow it to fit quite flat against the sides, the ends of the battens on the latter pieces will have to be cut off 1$\frac{1}{2}$ins. The front is composed of 3in. upright pieces let into the inside edge of a bottom batten, which is itself let into the sides. The spaces between the uprights are equal and will work out about 3ins. wide. The top of these pieces is nailed to a length of 2in. by $\frac{3}{4}$in. wood which is nailed to the sides. The sliding portion of the front is shown at *d*, and is composed of four 19in. lengths of 3in. by $\frac{3}{4}$in. wood nailed to a 32in. length of the same-sized wood, the spaces being equal to those already fastened in the front. To keep the horizontal bar in place it will be necessary to cut a slot in the side pieces and then nail on a strip of thin wood as indicated in the side view. The space between the top of the sliding bars and the cross piece should be filled in with a 2$\frac{1}{4}$in. wide piece secured by one nail at each end, so that it may be opened outwards as indicated by the dotted lines in the side view. The roof is made to lift off in the centre and this portion is shown at *e*.

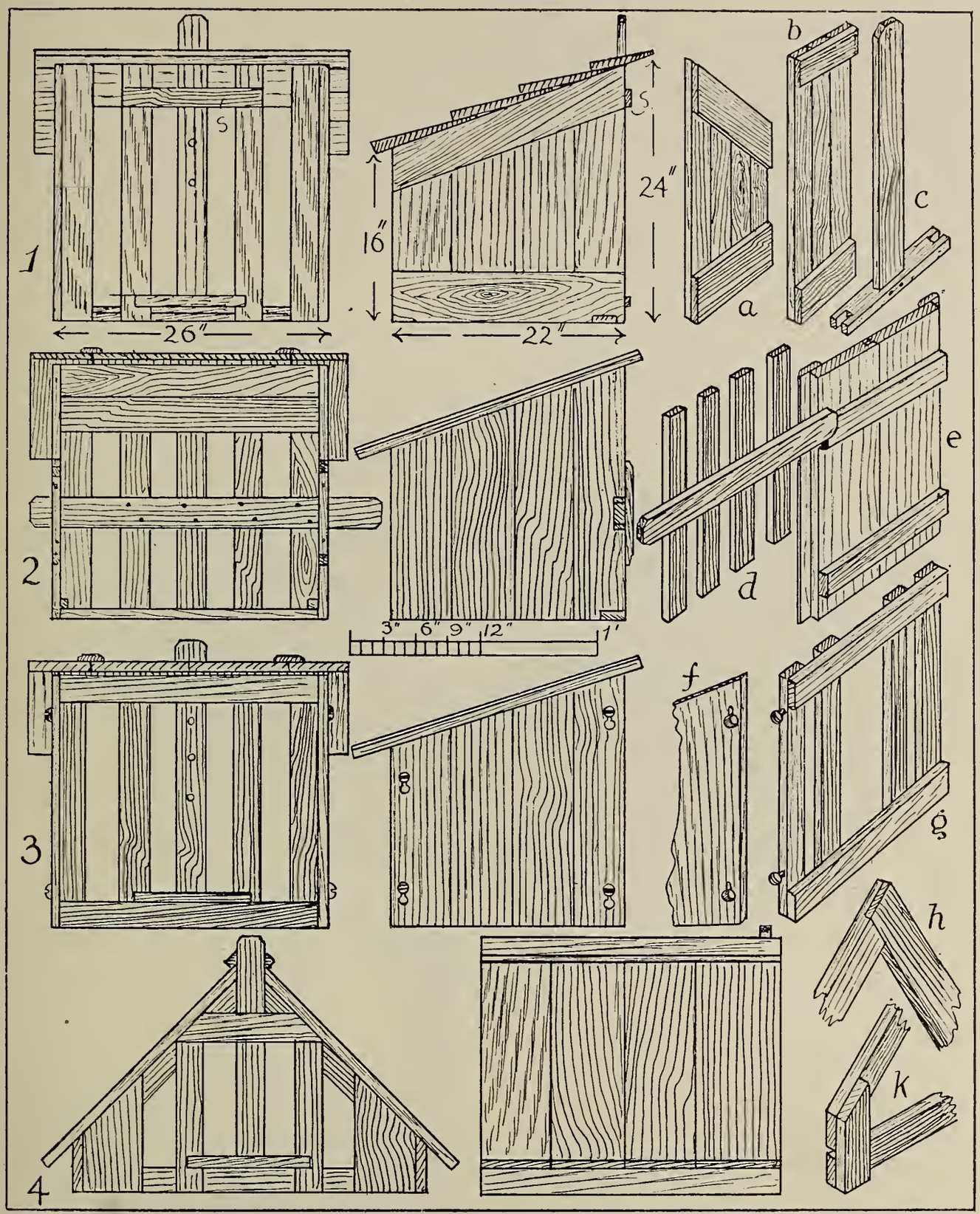
Coop No. 3.—The side pieces are made in the same way as in No. 2 coop, the back in a similar manner, but it will be fitted in place with the battens outside instead of inside. The front as shown at *g*, is 24$\frac{1}{2}$ins. wide and 24ins. high, and composed of 3in. wide strips nailed to 2in. wide pieces. The centre bar is fitted as shown at *c*, and kept in position by a strip nailed to the bars at the back. It will be noticed that there are two projecting screws on the upright edge; these are stout rounded headed screws with the inside of the head $\frac{3}{4}$in. away from the wood. In the portion of the side piece shown at *f*, it will be seen that there are two holes, the upper part being narrower than the lower portion. The upper part should be equal in diameter to the screw, and the larger part big enough to allow the head of the screw to pass through. It will be seen that if the side pieces are placed in position by slipping them over the screw heads, they may be pressed down and will be held quite tight. The top, made like No. 2, may be attached by joining the two outer portions by battens which should fit just inside the front and back. The ends of the battens should have a projecting nail and the nails should fit into the side. When the sides are pushed into place it will be impossible to move the roof.

Coop No. 4.—The back should be made by nailing some boards to a triangular frame made as shown at *h* and *k*, and the front as indicated in the front view. Join the front and back with a length of board at each side as shown, and then nail on the roof, placing a capping of narrow wood to make the top waterproof. The construction of this coop is so simple that no more instruction need be given.

Turkeys versus Oats.

An Alberta correspondent of the *Canadian Mail* shows how the profitable value of poultry breeding and rearing is being recognised. He says:

"One day recently a farmer drove into Calgary with his democrat loaded with dressed turkeys, says a Southern Alberta paper. When he arrived in the city he did not have the slightest notion of where to market the birds, but within an hour after arriving he had sold the lot at an average of twenty-nine cents per pound. The birds weighed an average of fourteen pounds each, and the sum realized altogether was $230. There is another story to this. Oats at the present time are selling for around twenty-one cents per bushel. This means that for one democrat load of turkeys this farmer secured more than he would have secured for 1000 bushels of oats. Altogether, he got for that one load of turkeys more money than he would have made on a carload of oats, and he did not have to work so hard or wait so long for his money as he would have done if oats had been his crop instead of 14-lb. turkeys.



Four useful Chicken Coops (see preceding page). [*Copyright.*

THE SICILIAN BUTTERCUP.

By J. Godwin Edwards.

(*See frontispiece*).

IT was at the end of August that Miss Blanch Stanton, of Lullingworth, in the Cotswold Hills, read an account of what was, to her, a new breed of fowls. This was the Sicilian Buttercup, so called from the peculiar formation of the comb, which is "v" shaped, somewhat like a cup, and consists practically of two single combs joined at the base. The description of the birds was attractive. The males were said to vary in colour from yellow to red, with black tail feathers and black flights. The females are more varied in their tints, the popular colouring being a golden buff nicely moulded with black. They were said to be winter layers, and to carry plenty of breast meat, therefore being likely to prove good all-round utility fowls.

Its History.

In the year 1862 a certain Captain Joseph Dawes, commanding the barque "Fruiterer," with a cargo of fruit on board, sailing from the Mediterranean to Boston, U.S.A., had a coop of peculiar birds which he had bought in Sicily. This is believed to be the first importation into America. The birds attracted the attention of Mr. C. Carroll Loring who purchased some of the eggs and succeeded in raising a fine flock of golden chickens. Although this was 40 years ago, he still breeds them. He is reputed to have given them the title of Sicilian Buttercups, but in their native place they are called by the Italian peasants, "Flower Fowls," on account of their cup shaped combs. Mr. W. R. Dewey has been instrumental in forming a club for the breed, which came into existence on March 26th, 1912. A standard of perfection has been drawn up, and at the last Rochester (N.Y.) Show he won many prizes with his birds. There is said to be quite a rage for the birds in America.

Its Utility Points.

It is claimed by admirers of the Buttercups that their utility properties are not surpassed by any other breed, and that their laying powers do not diminish until the third or fourth year. Further, they are as quiet and domesticated as any other breed. Their long keel shows that they are capable of carrying a large quantity of breast meat.

On reading the above description Miss Stanton wrote at once to Mr. Dewey, the president of the newly-formed club, asking him to purchase a trio for her and to despatch it with all speed, so that the birds would arrive in time for the Crystal Palace Show. With great difficulty Mr. Dewey succeeded in obtaining the birds, but owing to gross neglect on the part of the forwarding agents, they were not sent off in time for the International Show. The pens were, therefore, empty. Miss Stanton cabled to Mr. Dewey to hasten the delivery and entered the birds for the Birmingham Show. The trio were at last despatched in December, but, instead of being put on board a liner to Liverpool, they were shipped on a tramp steamer to Bristol. On their arrival they were washed, and Miss Stanton took them herself to Bingley Hall, where they excited a great deal of criticism.

Life at Lullingworth.

On reaching their new home after the Birmingham Show, the birds were fed on a nourishing meal and melted food tonic, and very soon picked up. They flew about the walled-in garden like pheasants yet were as docile as pigeons. The pullets were very precocious. One of them commenced laying on January 4th, and by January 11th had laid five eggs. Four of these eggs were put under a hen with some Rhode Island Reds, and three hatched out strong healthy chicks, weighing over two ounces each. The fourth was dead in shell. Miss Stanton describes the young Buttercups as "The prettiest little things I ever saw, with queer black markings all exactly alike." Four more pullets have arrived from America. Miss Stanton has been joined by her brother, Captain R. Stanton, who recently retired from the Army, and has taken up poultry keeping with a view to showing what can be done with a small amount of capital. Miss Stanton started in the spring of 1911, specialising with Rhode Island Reds, with which breed she was very successful.

A Capital Arrangement for rearing Chickens.

[*Copyright.*

A GERMAN POULTRY FARM.

Soddeutsche Geflugelfarn.

By Hugo Wusthoff.

THE farm that I want to describe, which was founded two years ago, is within twenty minutes ride of Frankfurt-au-Main and in the immediate vicinity of the famous Frankfurter forests. The farm comprises about 15 acres of good meadow land and three large ponds. The whole property is specially fitted out and arranged for poultry raising, with the side-line of fruit growing. For the latter purpose 11,000 selected fruit trees have been planted. Particular attention was paid to the different kinds of fruits, and only such qualities were selected as bring good prices and as were best suited to the soil. Most of the trees are planted in the poultry runs in order to afford the birds protection from the hot sun in the summer, and, at the same time, to give the trees a valuable fertilizer without extra expense. The effect of this trial has been most astonishing in such a short time, for the trees have grown considerably, and look healthy and strong.

To the right and the left of the road as one enters the farm, there are planted willows, which are cut and sold at the end of each season. A little further on are pens of 600 Pekin breeding ducks, each with runs of 80ft. by 20ft. for a hundred ducks. The runs are grass, and lead to the large pond, which is fed by a brook which runs through the entire property. A short distance behind the duck pens the main building is picturesquely placed at the highest point of the farm. The centre building consists of an office, and living apartments, while in the east wing is placed the shed which is arranged for and holds 40 incubators, with a capacity of 10,000 to 12,000 eggs.

At the entrance there is a store and testing room, while adjacent is a well-arranged brooding house, with accommodation for about 5,000 ducklings and chickens. On leaving the heating house one sees the colony houses scattered about the grounds, and on the north side is placed the 300ft. shed which is used for fattening thousands of ducks before they are killed and marketed. Pekin ducks are raised, and the breeding stock consists entirely of American and German-American Pekin ducks. Such perfect quality in such large quantities is seldom seen.

The main principle in duck raising on the farm is the careful feeding and treatment of the young ducklings, and the particular care that is taken in the selection of the birds for breeding purposes. Birds that do not originate from broods of first rate

On a German Poultry Farm. [*Copyright.*

Pens and runs containing 600 Pekin breeding ducks.

quality are almost worthless for breeding purposes, because experience has taught that such birds, even as green ducklings, are not of such value as those of perfectly hatched ducks. Work and knowledge are of no value if the breeding stock is not of first quality.

Outside the building already mentioned there are also well-equipped killing, packing, and transporting rooms, with ice storage house attached. Then there is the kitchen for preparing food, and a large feed room above, where the feed is mixed and sent to the kitchen ready to be prepared in the proper proportions. All over the farm there is a miniature railway with a mile of track, which has proved very useful for transporting large quantities of food. Not only time, but also a great deal of labour and money have been saved through this arrangement.

Besides Pekin ducks, white German Imperials (*weisse Reichcherhuer*) are kept in large numbers. Among them there are a number of hens that laid twenty-two to twenty-four eggs in the month of January. The Imperials are of a comparatively new race, and there are several varieties, including white, light brown, and barred, of which the white ones appear most frequently. This breed will no doubt have a great future. It is a particularly fine layer, and it is preferred to all others because of the large number of eggs it lays in the autumn and winter. It is not so good a sitter as many other heavy breeds, but nevertheless it is a good and careful mother. It is also well suited for killing purposes, because it has all the qualities that are required in a first class chicken. It has white legs, white meat, and is extremely juicy and fleshy, so that the breast bone is not as visible as in the other breeds. Neatly packed and dressed it looks most appetising, and is highly appreciated by connoisseurs.

Pekin Ducklings on a German Farm. [*Copyright.*

Only on fine days are the ducklings allowed into the runs; when the weather is inclement they are confined in the rearing sheds.

Prices in Natal.

To the farmers in the back blocks poultry-keeping has not yet seriously appealed. Work on the fields is too strenuous, and the women have their full share of the burdens; yet in every homestead and round the poorest looking "humpy" a flock can be seen. These (says the *Natal Witness*) supply the family with eggs, and occasionally a few are sold in the stores, or to the merchants' vans. Prices obtained for surplus eggs marketed in this irregular way are necessarily low. From 6d. in the plentiful to 1s. 2d. in the scarcer months may be taken as a fair average.

Profitable Poultry.

Of all the branches of agriculture there is none so profitable as poultry-keeping, considering the amount of capital invested. A large sheep farmer in the midlands recently stated that a good laying hen was more profitable than a breeding ewe.

THE HEN AND HER BROOD.

By F. W. Parton (*The University, Leeds*).

GIVEN fertile eggs from parents that have been well mated as to age and suitability in characteristics, all that is required for the consummation of satisfactory results is proper management of the sitting hen. After being convinced that the hen is thoroughly broody, and intent on performing the twenty-one days of sitting, the first thing is the formation of the nest. This must be one that will make her as comfortable as possible during the fulfilment of her task, and at the same time provide for the requirements necessary for the full development of the embryo.

The hen commences her broody fever by remaining on the nest in which she has been accustomed to lay, or perhaps, if she has the run of a farm, seeks her nest in some place after her own liking. It is much better, however, to keep her under control in a place provided by the owner. She is sometimes reluctant to exchange, but a little tact is all that is required. She should be gently removed to the box in which she has to sit, and if there is any doubt as to her taking to her new quarters, a few dummy eggs should be put under her until she has settled down.

The box must be roomy and sufficiently high to allow of ventilation without the inflow of air beating directly on to the hen. If the box be made eighteen inches high it will obviate the danger of a draught, and tend to the well-being of the chickens, since air is conveyed to the embryo by means of the allantois from an early period in its development. The allantois is a fine membrane which envelopes the embryo, and it continues to develop until eventually it entirely surrounds the white and is closely connected with the shell membrane. The function to be performed by the allantois—and it is provided with blood vessels for the purpose—is to bring air through the pores of the shell. This, by means of these blood vessels is conveyed through the body of the embryo. We gather from this how absolutely necessary it is that nothing but the purest air should surround the eggs, and that the pores of the shell should be kept free from dirt or anything else that might prevent the ingress of air. The box should be made without a bottom with an upturned sod placed therein, and a thin covering of straw, just enough to keep the eggs from lying on the moist earth.

Second only in importance to fresh air is a good supply of moisture. This, however, is an essential that is provided naturally, since the atmosphere will give all that is required. When, however, the hen is sitting on duck eggs, unless the position selected is in a damp place, it is necessary, except in a very wet season, to give more moisture than can be obtained naturally. The most simple and efficient way of supplying moisture is to saturate the ground immediately round the nest with warm water; the eggs are thus surrounded with a moist atmosphere, which is more readily absorbed by the egg than is possible when the eggs are sprinkled or dipped in water.

Cooling the eggs is a further matter which is highly important, and has a distinct influence on the hatching results. It is quite a common fault to cool the eggs insufficiently. It is, of course, somewhat difficult to lay down any hard and fast rule in this connexion that would be applicable under all conditions, since the actual length of exposure must be determined by the state of the weather. For instance, half-an-hour or even longer would do the eggs no harm in a fine open season, yet a third of this period might mean death to the embryo during five or six degrees of frost. In an ordinary hatching season the eggs may be cooled for twenty minutes during the first week of incubation, and for the second week the time may be increased to twenty-five minutes, while during the last week, provided that the weather is still favourable, the time of exposure may be, with safety, extended to half-an-hour. The object of cooling the eggs is to stimulate and strengthen the chickens, which is a necessity for their full development. The time to cool the eggs is when the hen is off her nest at feeding times. This should, however, be done at regular times; that is supposing the hen is fed at eight o'clock in the morning, then this hour should be the meal time throughout the whole process. The digestive organs of the hen are thus regularly exercised.

The hen during the twenty-one days of sitting should be fed entirely on hard corn, and for preference this should be barley or maize, because these maintain the bodily heat of the hen without being of a too fattening nature. A dust bath in which a little insect powder has been sprinkled should be within reach of the hen when liberated from her nest. This is the most effective way of keeping parasites in check. Perfect cleanliness must be observed, since insect pests are encouraged more by neglect in this direction than by anything else. Vermin adds considerably to the discomfort of the hen, and is most destructive to the newly hatched chickens.

It depends almost entirely upon the early management of chickens as to what their ultimate value will be. By good and efficient management now, we are expending energy that will bear fruit when the present-day chickens become the breeders of next season. The best place for chickens is on a light gravelly soil, and in such a position that the chickens may have shelter in the direction of bushes, shrubs, etc. If they have access to up-turned soil where they can obtain plenty of scratching exercise, it is of inestimable value in assisting their growth. All poultry keepers have not, of course, a perfect place upon which to rear their chickens, but by a

little judicious manœuvring they can greatly improve even the worst of places. There is one matter, however, upon which too much emphasis cannot be laid, and that is the importance of having a dry run. Cramp, diarrhœa, and bad circulation are a few of the troubles to which chickens are exposed if reared on a damp soil.

Division of the Rearing Ground.

The place, therefore, selected for this purpose should be dry and sheltered, and sufficiently far removed from the general track of fowls, so that the chicken cannot easily mix with them. It is very bad management to have fowls of all ages occupying the same ground, since the young ones inevitably fare badly. Whenever circumstances will allow it is an excellent arrangement to divide the rearing ground into two, three, or more portions, so that each in turn may be used. It will invariably be found that the first and second batches do excellently, but when the third lot appear and the birds are put upon the ground which was occupied by the first two batches, the third occupants will certainly not do nearly so well. The fourth to enter the same run will do even worse, and so on throughout the season, It is not, perhaps, that the ground is actually contaminated. It merely is that the first freshness is gone from the land, and that it is getting worse and worse for each batch of chickens, until by the end of the season the late chickens are vastly inferior to those that were the first to appear. This trouble may be effectually overcome by dividing the run as already mentioned, and by avoiding putting two batches in succession into one run. Even three weeks will have the effect of freshening the ground to a remarkable degree.

Shelter.

It is necessary that chickens should have adequate protection from cold and easterly winds, and from rain and all the inclemencies that are to be faced during February, March, and April. We do not mean by protection that the chickens are to be kept continually under cover; rather let them rough it a little, and run out in the open in all weathers if they are so inclined, but let there be shelter and warmth for them to run to when required. If a roomy shed can be given up for them to shelter in, it should be well littered with dry and clean chaff, among which seeds may be thrown to encourage exercise. When such an excellent addition as a covered shelter is not available, and no trees or shrubs are in close proximity for natural shelter, shade must be temporarily erected. Hurdles plaited with straw a foot high will give ground shelter from the sweep of March winds. Canvas about three feet wide made in twenty-yard lengths can be purchased very cheaply, and this affords excellent shelter. The canvas is arranged by pegs about a yard apart firmly fixed into the ground, and may be placed round the coops, brooders, or chicken houses.

Space for Chickens.

This is a question that deserves the greatest attention. Overcrowding must be studiously avoided if the chickens are to be successfuly reared, and develop into healthy and robust stock. It is much the more economical plan to rear only a limited number of hardy and strong chickens than it is to

Rearing in the natural way. [*Copyright*

rear double as many that are weedy and delicate. Breeding more chickens than the ground will carry, or the existing houses will accommodate, is bad in a direction that is not often regarded. Suppose a poultry keeper has sufficient space to divide into separate plots, and do justice to the rearing of, say, five or six hundred chickens, and he has also ample sleeping accommodation for this number, were he to attempt—and it is a very common error—to hatch and rear a thousand or twelve hundred birds on the same space, we do not hesitate to say that he would have twenty-five per cent. better monetary return. This, of course, would be on a strict valuation taken at the end of the season, including the cost of the eggs from which the chickens were hatched and the cost of incubation, feeding, and labour. Mortality would be very much higher, proportionately, from the larger than from the smaller flock, and the individual value of the stock when they reached adulthood, would be all in favour of those that had the greater chance from chickenhood by not being restricted as to space.

MAMMOTH INCUBATORS.

THEIR ADVANTAGES AND DISADVANTAGES.

By T. F. McGrew, of Scanton, U.S.A.

WITHIN the last few months there has been issued from the Agricultural Department at Washington an estimate of the agricultural products of the United States for the year just closed. This statement gives the quantity of poultry and eggs consumed during the past year as having a value of about 750,000,000 dollars. This is the poultry product that can be traced through the selling districts of the country, but does not include that produced by the back-yard fancier and by other persons who keep a few hens, the product of which they sell in their own locality.

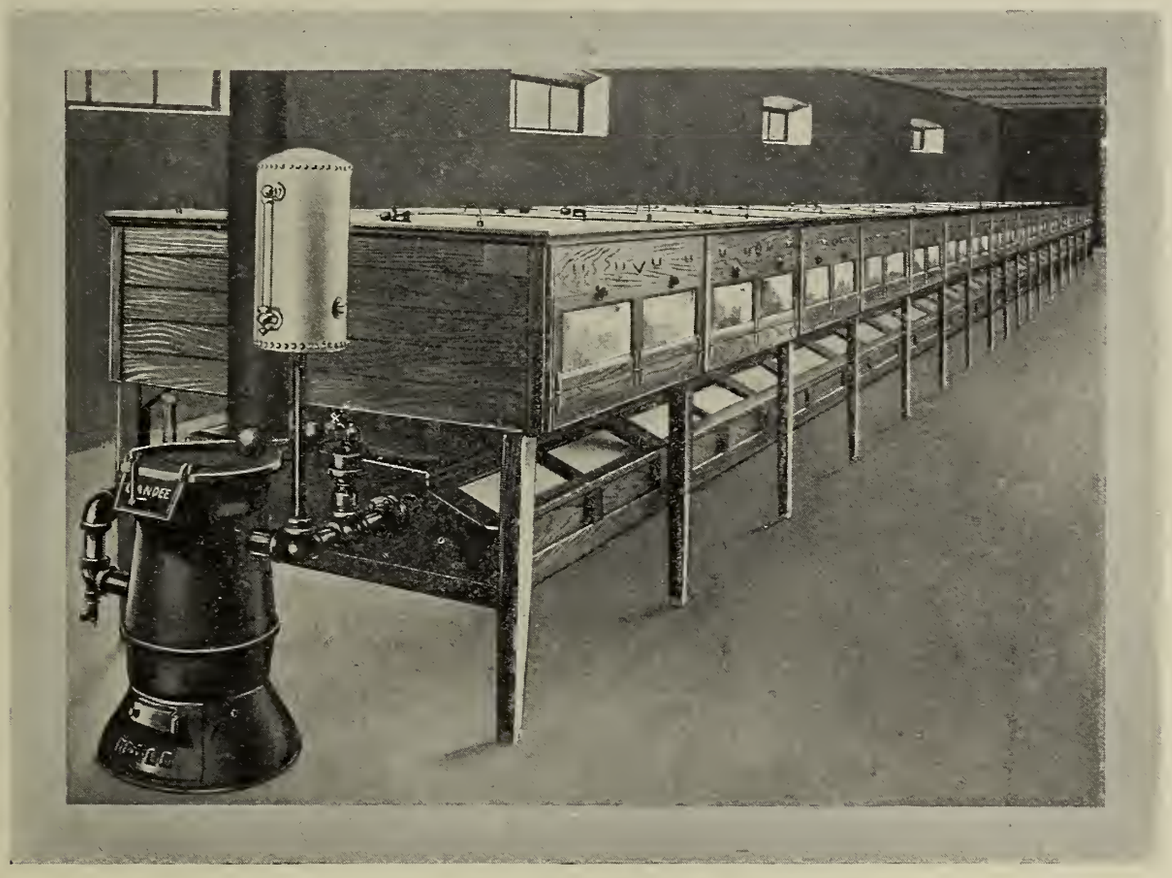
To produce this vast number of poultry many millions of eggs must be hatched annually. To hatch and rear so many chicks at a price that will make possible their consumption by the masses, means that unusual facilities must be devised for both hatching and brooding. For this stupendous work a system of mammoth machines has been devised.

The original system for hatching many eggs in a single machine was inaugurated in the United States about 1895, when a machine having a capacity of 6,000 eggs proved to be fairly successful, and while this original machine could not be handled readily by an amateur, it attracted so much attention as to engage in its improvement many of the incubator experts of the world.

The Advantages of this System.

At present several kinds of mammoth machines are manufactured; all of them are heated by hot water, which seems to be of great value for the reason that as many as 12,000 eggs can be incubated in a single machine with but one source of heat—a self-feeding stove, in which hard coal is burned. This kind of heating system does away with the fumes of oil in or about the incubator room and machine. These incubators are constructed with a system of apartments, each of which will contain about 600 eggs in the egg trays; each of these apartments can be heated separately or cut out entirely, and each has its own regulating system in its egg chamber. While the twelve or twenty apartments are all of them connected in one mammoth machine, each apartment is an incubator in itself, with a capacity of 600 eggs.

Another feature of advantage is that under the



A Candee Mammoth Incubator, with an egg capacity of 10,000. The temporary brooder is beneath. [Copyright.

present or more modern system the trays in each separate apartment may be filled from day to day. In one instance, two 6,000-egg machines were installed in one incubator cellar, the capacity of the farm being about 1,000 eggs per day. Of these eggs, 600 of the best are selected each day and placed in the trays of one apartment. The two machines have twenty apartments; one of these is filled and one is emptied each day. There is thus a continuous supply of eggs and chicks from this establishment.

Cellars are built of a proper size for holding these machines. The best results are obtained in cellars about 9 feet in the clear from 5 to 7 feet below ground, and from 2 to 4 feet above ground. Windows for light, air and ventilation are placed above the surface of the ground and the overhead is covered and tightly sealed. Feed-houses, offices, and even brooding houses are frequently built over the cellar in which the machines are installed. Where two or more machines are used, the stove for one incubator may be at one end of the building and that for the other machine at the other end of the building, thus giving better distribution of the warmth that reflects from the stove into the room.

One attendant can care for two machines of 24,000 egg capacity; that is to two machines with twenty apartments in each machine. When machines of this kind are in use, watchmen are kept who visit the machine hourly, both day and night and between visits pass through the brooder house and the breeding houses. Such inspection assures the protection of the poultry, prevents accidents in the brooding house, and secures proper regulation in the incubator cellars.

The Disadvantages.

Recent improvements in the heating apparatus and regulators have made more nearly perfect the automatic control of the heat; although there is very little need for artificial moisture in these machines, it is quite important that the thermometer in each compartment should regulate correctly. To assure perfect regulation requires constant watchfulness on the part of the operator, for if the fire in the stove should burn poorly or go out, or if for some reason the circulation of the water through the pipes should cease, all the eggs in that machine may be chilled and lost. Although this occurs but seldom and each year there is less likelihood of it, yet, as with a balloon, of which but few are lost, when a loss does occur, the catastrophe is complete and without remedy.

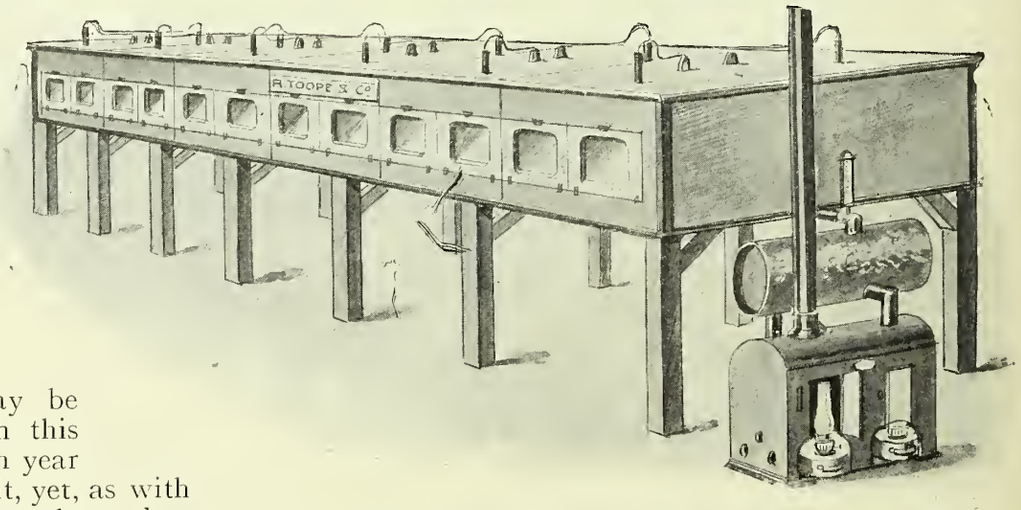
All in all, the advantages of this system are far in excess of the disadvantages. This is evident from the fact that although there is a steady increase in the number of individual incubators sold, there are five times as many mammoth incubators now in use in America as were in use three years ago. A number of poultrymen who originally installed a three or four thousand egg machine have since added to them by increasing the sections or units, the construction of the machine making this possible, with but few changes; and many persons who formerly used six and twelve thousand egg machines, now have machines of double that capacity.

The Requirements for Success.

A gentleman who visited the enormous hatching ovens of Egypt two winters ago and spent considerable time with those who operated them, said:—"It looks easy for them and they do remarkably well with the system, yet if three Americans were put in charge of the one I visited, that is run successfully by three natives of Egypt, they would fail." When this was mentioned to the Egyptian, he replied: "My people have run this for more than a thousand years, and we should not know what to do with a machine like those of which you have just shown me pictures." The one who visited the oven had with him a catalogue of the mammoth incubator manufactured in America, and in comparing its value with the clay pots of Egypt the Egyptian said: "If we had them here, by the time my sons had grandchildren they would know how to handle them to hatch every egg."

The success so easily achieved by the Egyptians indicates that equal success with the mammoth incubators must depend largely upon the patience and watchfulness of those who operate them, for even now they do equally well or better than the individual machines. The machines will do the work; they only need proper handling.

[An article by Mr. McGrew, on Mammoth Brooders, will appear in the May number of the ILLUSTRATED POULTRY RECORD.—*Editor.*]



An English Mammoth Incubator. [*Copyright.*
The Toope Asbestos Machine.

FANCIERS AND FANCY MATTERS.

By William W. Broomhead.

Mr. C. H. Britton's Indian Game.

With the keen competition that prevails now-a-days in a breed which enjoys anything like popularity in the Fancy, it is considered a great achievement for an old hand at exhibiting to put down a bird which will beat all comers at a club show. So what of the fancier, and himself a novice in the variety, who can do better, and at such an important event as the Crystal Palace, where the pick of the yards are penned for competition? It wants doing! Admittedly, and yet at the Indian Game Club show held in the great Sydenham glass house last year, Mr. C. H. Britton penned such a team that his birds won five out of eight possible red tickets; three in the open classes, one in novices (hen or pullet) and the other in the two-guinea selling class for cock or cockerel. In addition, he secured two third prizes and two reserves, while among the specials awarded to his birds were three open challenge cups, the International challenge trophy and medal, and the Hassall champion cup for the best Indian Game fowl at the show.

Quite recently I had the pleasure of visiting Mr. Britton at Great Longstone, Derbyshire, and I must say that I was delighted with the birds I saw there. A feature, of course, is made of the Indian game, but other breeds in which Mr. Britton specialises are White Leghorns and White Orpingtons, While Barred Plymouth Rocks, Buff Orpingtons, White and Blue Wyandottes, and Houdans are also kept, and there is a trio of Black Red modern Game Bantams. There are seven matings of Indian game, four of White Orpingtons, and three of White Leghorns, in addition to several of the other varieties mentioned, and there will be some prize winners hatched from them this season. At the time of my visit a hundred or more chickens were being reared, and fine specimens they were, while hatching operations were in full swing, eggs proving very plentiful and fertility being high.

The farm, which consists of some sixteen acres, is splendidly planned, and stock birds and chickens alike are given plenty of room. The pens are arranged in three sets, and the layout is such that the labour of attending to the birds is reduced to the minimum. Mr. Britton is a keen fancier, but since he is also the head of a great Manchester house he cannot spend the whole of his time among the birds, hence he employs a poultryman to look after the stock in his absence, and the poultry are well done. One of the features of the farm is the show house in which the birds are put through their paces. This consists of twenty-six wire fronted cages, each four feet by three feet, and the building is so erected that the inmates get the maximum benefits of sunlight and fresh air. It happens, therefore, that while the birds are kept up during the exhibition season they are penned where they will be naturally fit and need no special conditioning for showing, which, there can be little doubt, is one reason for Mr. Britton's success at the exhibitions. His is, indeed, an ideal yard, and one well worth a visit if only to see how to keep fancy stock.

Exhibition Ethics.

I was glad to see the diary note on the above subject in last month's Illustrated Poultry Record, since the subject is one of great importance and has evidently been overlooked by the weekly press. That the Poultry Club should take the matter up and deal with it according to the rules of that body goes without saying. Will the club do so? It has been accused of letting things slide and of interfering with matters with which it has no concern and over which it has no jurisdiction. But here is one that deals solely with the Fancy and one that calls for immediate action. Hence, if it wishes to show its strength let it get going on the subject without delay.

Redcaps to Boom Again.

There was a large attendance of fanciers at the annual meeting of the Redcap Club, held at Darley Bridge last month, and an effort is being made to place the Redcap well to the front again. The breed is, indeed, a good old English one, and since it has held a very high place as an egg producer, I hope the attempt to popularise it once more will meet with the success it deserves. A general discussion took place at the meeting, and the standard of the breed came in for a good share of it. The decision arrived at—and rightly so—was not to alter the present one; and it was stated that the comb or "cap" should be carried clear of the birds' eyes, so that the fowls are in no way inconvenienced by their headgear, and to avoid the necessity of its being dubbed to render them fit for the breeding pen. This is, indeed, a most sensible move, since as the Spanish went out on account of the extremist breeding for quantity of face, there can be little doubt that the craze for excessive size of comb was to a great extent responsible for the Redcap's fall from grace some years ago. It was also decided to pay a little more attention to the colour of the plumage; but, after all, that is not a very important point.

The meeting was most enthusiastic on the question of bringing forward the merits of the Redcap fowl, and much good work was accomplished in its interest. Some well-known fanciers were elected as officials of the club, and a good list of club judges was got together. The club show is to be held at Manchester, while two classes are to be guaranteed for the breed at the Crystal Palace. In addition to these events the club will support and put on specialist judges at the following shows:—Wirksworth, Monsal Head, Darley Dale, Baslow, Hope, Matlock, Bonsal, Derby, Tideswell,

Hallam, and Ecclesall. These exhibitions are all held within the county of Derby, unless it be the last-named which, however, is on the border if not indeed within the county boundary. This may appear, perhaps, too much like keeping the breed at home; nevertheless in my opinion it is an excellent start. I may mention that Mr. Heathcote is the hon. secretary of the Redcap Club.

To Resuscitate the Liverpool Show.

At one time, and not so many years back, Liverpool could boast a series of fanciers' shows that used to rank as the classics of the year. It is true they were held rather late in the season, and were, in fact, considered as the last events of the year, but to win at Liverpool was to secure something that placed one's stock among the best. For some reason, however, they were dropped. It is now on the cards, however, to resuscitate them, and at a recent meeting of fanciers held at the Exchange Station Hotel in that city there was a most encouraging attendance. Mr. E. R. Crippen, who occupied the chair, stated that his mission was to ascertain if a society could be formed to take in the Formby Society in the event of the members desiring to join; his duty was to obtain their feelings on the matter. An interesting discussion resulted, and the whole of the company was decidedly in favour of such an event taking place in Liverpool. The general consensus of opinion appeared to be that there was no reason why a Liverpool show should not again hold a prominent place among poultry exhibitions.

A very good scheme was outlined, and all present were in favour of it. Indeed, it received generous financial and personal support, and I hope to give an account of this scheme in subsequent notes. Letters promising both financial and personal support were read from Messrs. E. A. Atherton, J. Lewis, Hugo Ainscough, E. C. Stretch, C. M. Nicholson, and J. Wilkinson, most of whom were connected with the old series, while Messrs. J. and W. Birch also wrote giving some excellent advice and propositions, and stating that they wished it to be clearly understood that they were fully in favour of the idea and thought that at this time it would be as well for the younger generation to get into harness. Among those fanciers who were present at the meeting were Messrs. A. H. Hulme, J. Lytle, F. Bayley, R. Mitch, J. Smith, H.S., Hodgkinson, G. Wakefield, A. E. Brown, E. Astbury, H. A. Jolley, W. I. Gill, Gordon Lee, M. Shuddich, J. Woodwaith, J. A. Anderson, S. H. Kennedy, L. Britland and A. E. Atherton.

White German Imperials. [*Copyright.*

The above birds have won many prizes in the most important German Shows. (See page 309).

Campines.

Dare I mention the breed? And what a kettle of fish. English or Belgian Campines—which? Both! Well, well, the club can settle its own affairs, and meanwhile the outsiders will wait and see—and take up some other breed. This question of which type shall have preference at the English shows is merely history repeating itself. Fanciers went through it with the Game fowl, and the outcome is Modern and Old English Game. As a matter of fact they have not settled even yet about

the Old English Game, since two distinct types are shown. The Langshan then went through it and got Croads and Modern Langshans. The Sussex men did likewise, and the result is Jubilee Orpingtons and Speckled Sussex, once almost alike but now as wide apart as the poles—or nearly so! Plymouth Rock breeders had their differences of opinion; and two clubs exist for the Barred variety, with something, ever so little maybe, between the types fancied. Others there were; others there will be, no doubt. If the Belgians like to push their ideal Campine forward they will do so; but it is up to the English fanciers to show that the improved type is by far the better of the two.

COOPS AND COOPING.

THE time is quickly approaching when all chicken rearing appliances, whether of the natural or artificial pattern, will be required for use, since broody hens are already plentiful. It is an excellent plan to make all arrangements preparatory to the arrival of the chickens, and all emergencies, as far as possible, anticipated. The best kind of coop and the most suitable position for it to occupy are of paramount importance in the early management of chickens, and consequently these points must be duly considered, since a damp place, or an exposed position during the uncertain weather of early spring may have the most disastrous effects.

There are many different kinds of coops in common use at the present time, from the easily converted sugar or bacon box, to the smartly turned out and well-finished product of a manufacturer. Whether they are of the primitive nature of the former or of the more expensive kind, the same general principle should be applied. In the first place, the coop should be sufficiently roomy to ensure comfort and freedom of action to the hen, and greater safety to the chickens. If the coop is small and cramped there is danger of the chickens being trampled on.

The next point to observe in the construction of the coop is that there shall be a portable shutter, or some similar arrangement, which will protect the inmates from wind and rain, and, later on, it is to be hoped, from the sun. It is better to have the coops built without a permanently fixed floor. It is absolutely necessary, however, during the early months of the year, even on the most suitable of soils, to have a wooden floor. The coop should be placed upon the temporary floor, which should be made a little larger than the coop, extending a few inches in front, say, six or seven inches, so that when hen and chickens are confined, they can always be fed on a dry place. If, however, the soil is heavy a floor of this description is required at all seasons. The only object gained by having a portable floor is that the work of cleaning is more rigidly carried out, and nothing that simplifies this is too insignificant to deserve consideration.

Often when making a coop the importance of ventilation is overlooked, the idea being that because the coop is placed out of doors and has an open front it is sufficiently ventilated. This is not so, however, if the coop is made, as it ought to be, with closely fitting joints. It requires ventilating holes at the top, clear above the head of the hen. Breathing impure air is bad for both hen and chickens, and must be prevented at any cost.

The most important point to observe in the care of young chickens is to protect them from damp surroundings. The coops should, therefore, be placed upon the highest part of the land, placed so that the fall of the land is from, and not towards the coop. It is also highly important that they should face due south, thus being protected from the north, and the treacherous east winds. When arranging the place upon which chickens are to be reared, it is of the utmost importance that it be quite apart from the ground upon which the adult fowls exist. As a matter of fact, if the land is not sufficiently extensive to allow of this separation, it is inadvisable to rear chickens. The rearing ground should, therefore, be a piece of land that can be especially kept for the hatching period, and in the interval between the seasons it should be sufficiently sweetened to obviate all danger of contamination from the previous year's work. The grass should be kept short in the immediate vicinity of the coops for if it is long the chickens are liable to become wet and draggled, which certainly does not tend to their well-being. The greatest difficulty that the poultry-keeper who rears his chickens out in the open has to contend against is cramp. This is caused more frequently by allowing the chickens to run in among long grass, than by anything else. If, therefore, the coops cannot be placed sufficiently far away from this danger, the only way to overcome the difficulty is by keeping the hen shut up in the coop until the chickens have got beyond the very early stages, when the tendency to cramp is not so great.

When the chickens have remained in the nest long enough after hatching to become thoroughly dry, the hen and her charges should be removed into the coop, and there made comfortable until the time arrives for the chickens to have their first feed. The hen should be fed and watered immediately she leaves the sitting box, after which she will return to her brooding duties in the coop with renewed vigour. It is usually found the best plan is to keep the hen fastened in for three or four days and allow the chickens to stray round the coop. They never wander too far away when at this age. About the fourth day, provided that everything is favourable, it is desirable that the hen should be liberated with the chickens. There are, however, several matters that must be taken into consideration before this is definitely done. The most important factor in governing this matter is the situation of the coop. If there is any likelihood of the hen taking the chickens to a damp or otherwise unsuitable place, where there is a possibility of their coming to harm, then, of course, it is inadvisable that the hen should be at large.

SCIENCE AS APPLIED TO THE POULTRY INDUSTRY.

By Dr. Mary E. Pennington.

EGGS.

Studying the candling of eggs by critical mathematical methods has indicated that in the average good packing house at the source of production with the average good egg candler there is a constant loss from good eggs going into the case of rots especially when candling seconds. This may be simply mechanical carelessness on the part of the candler because of the misshifting of eggs in the hand, or it may be due to faulty observation of the egg before the candle, or a faulty interpretation of that observation. Whatever be the causes, the result has been that 25 per cent of seconds, which are good eggs, are put among the rots. In order to obviate this loss we tried installing a checking system whereby each candler was given a number and a paper check bearing that number, which check was put into each case when it left the candler. In this manner each candler could be held responsible for his work, and at any time a case could be referred back for re-candling. This system did not in the least obviate the difficulty which we desired to remedy. The 25 per cent. of good eggs still went out with the rots. A system was, therefore established of over-inspection. That is, all the cases containing discarded eggs were recandled, either by the superintendent of the candling room, or by a person whom he selected as the most expert grader, generally after it was done by the superintendent himself. By this means, 16 per cent. of good eggs were recovered from the rots. These figures were determined, not by candling alone, but by breaking every egg saved from the discards. It was found, even with the most accurate candlers obtainable, that about 6 per cent. of good eggs still continued to be thrown away with the rots. On the other hand, when the candlers knew that all of the discards were to be inspected, they developed greater care, and instead of 25 per cent. of good eggs being thrown out the number was reduced to approximately 20 per cent. There is still a problem here for the saving of the 6 per cent. of eggs which, up to the present time, we have not been able definitely to distinguish by means of the candle. With this system the bad eggs going into the good eggs were kept at 5 per cent. less.

Translating the savings as accomplished by a more scientific management of egg candling into dollars and cents we found that in one packing house during the months of May and the middle of August there were candled over 1034 cases of discarded eggs. 19 per cent, of good eggs were saved from these discards, which, at the rate of 15 cents per dozen, amounted to $884.07, an amount well worth saving in any individual house, and, if applied proportionately to the houses all over the country, would aggregate a very large sum of money.

POULTRY.

There are many places in the routine of the handling of poultry and eggs where the general principles of scientific management can be applied without recourse to stop-watch experiments and mechanical calculations since the advantages to be gained by the use of certain methods, arrangements of buildings, etc., are so plain as to be self-evident.

Too often the poultry packing house is located in a building which was intended for quite a different purpose, and which cannot be so remodelled that the work may be performed economically. The entire cycle of receiving, feeding, dressing, and packing, should, to be ideal, proceed progressively, and on the same floor level, thereby saving the trucking expense of cross hauls as well as the wear and tear on the birds and the equipment. The space required, however, would be prohibitive in the great majority of cases, hence the work must be divided among two and perhaps three floors.

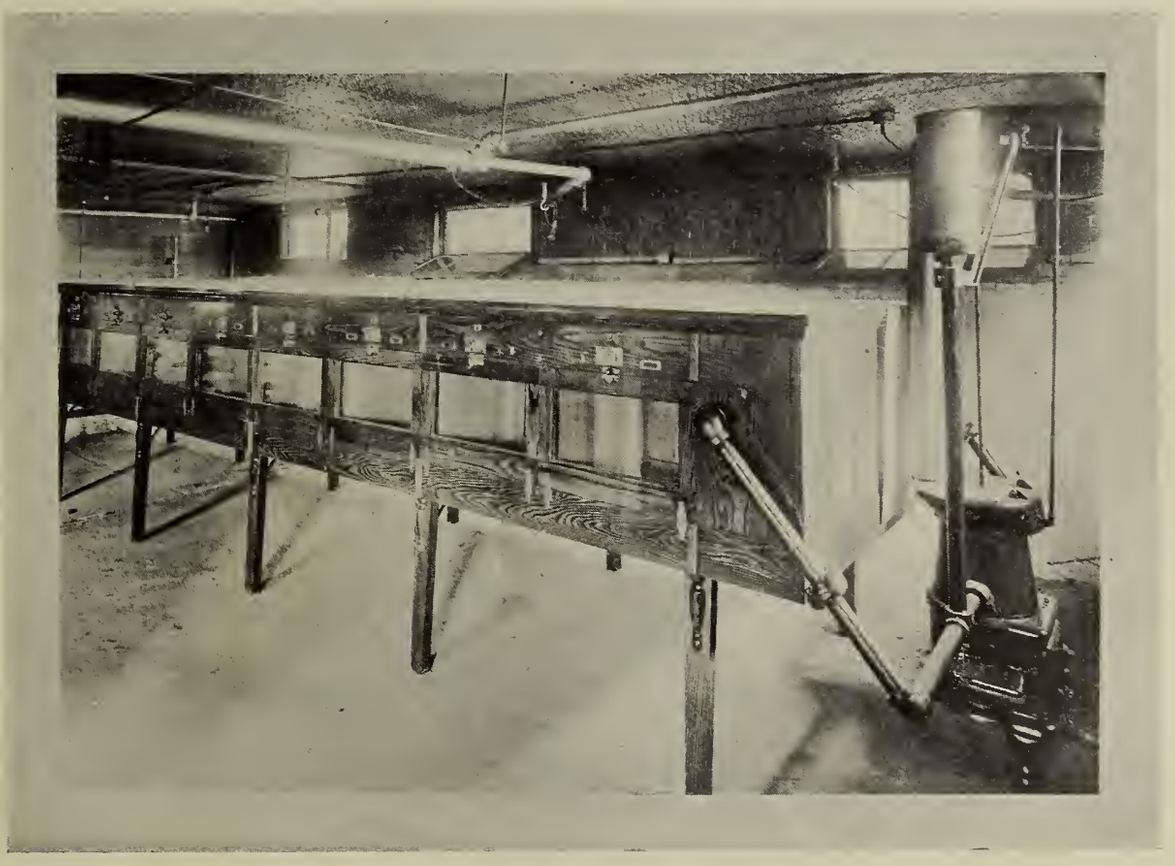
Our observations would indicate that the most important questions to be considered in the arrangement of a poultry house are an abundance of fresh air and light. Without these essentials the house cannot be kept clean and dressed poultry emanating from dirty surroundings invariably bears the stamp of that fact. The greatest amount of fresh air is required in the feeding station, therefore, it is advisable to locate it on the topmost floor, unless it be established as a separate building. The elevator leading to the feeder should be near the receiving platform and weighing-in scales to obviate unnecessary moving of batteries, which is bad for both batteries and birds. For economical handling there should be installed a floor scale on which a small truck can be wheeled and four or five coops weighed at one time. Where a platform scale is used two men are required to handle the coop and turn the chickens out and one man is required to weigh. By using a platform truck and a floor scale two men can handle four coops individually. Having weighed the coops, the chickens should be sorted at once into their proper feeding batteries, whether they are to be fed for a length of time or merely held for a short time before killing. The chickens should be graded into the feeding batteries according to sex, age, etc. The time used to transfer the the birds from the coops to the batteries is somewhat longer than is required for emptying the chickens into a large pen, but, on the other hand,

[Dr. Mary E. Pennington is chief of the Food Research Laboratory, U.S. Department, and has been telling the result of investigations made respecting eggs and poultry to a gathering of buyers at Chicago. The following are extracts from her interesting address, which, it may be pointed out, was dealing with American conditions where the territory is large and the producers in many cases far from the consuming centres.—Ed. I.P.R.]

there is a great gain to the chicken in the fact that it can readily obtain its proper share of food and water. There is a minimum of bruising of the flesh and breaking of wings, because there is less handling of the birds and their number and weight, both when received and when going to the killer, may be kept far more accurately. Having weighed and recorded the birds on their entrance to the packing house the battery should be transferred immediately to the feeding station, which, for the purposes of this discussion, we will consider to be located on the topmost floor of the packing house. Having fed the birds the appropriate length of time, we would then drop them down one storey to the killing room. The room where the poultry is dressed should be the best lighted part of the packing house, yet this is the room which we ordinarily find located in either a basement or a half basement where the pickers work by artificial light a large proportion of the time.

There is vast room for the application of the principles of scientific management to the conduct of most of our poultry dressing rooms. It is a regrettable fact, and yet it is, nevertheless, a fact, that most of our poultry plants are managed by the labour employed and not by the manager. In fact, in many of them the manager lives in terror, fearing that his men will strike or leave his employ and he hesitates to make any suggestions to them involving a change in their methods of work. The bad results which they turn out are apologised for by him on the grounds that it is exceedingly difficult to obtain labour to handle poultry and that he cannot afford to be at odds with his men. We have observed that in comparatively few houses where the usual methods for regulating labour is governed and where the standard of work is fixed high and firmly held there by the management, there is not only a much better class of workmen, but those workmen stay in the employ of that house year after year, having its interests at heart as truly as the management itself.

In most of the poultry dressing rooms it will be observed that the methods to be used are many times left entirely to the discretion of the workmen, and in the same room one will frequently find four or five different kinds of killing knives, varying from an oyster knife to an old silver-plated table knife ground to suit the peculiar notions of its owner. There is no attempt at the standardisation of knives by the manager because the men object to changing. The Department has worked out, by the most accurate methods available, a knife especially adapted to kill and bleed a chicken in the best and most expeditious fashion. Where a knife of this type is used, the results amply justify a positive stand taken by the manager in that regard, and the killers themselves, when compelled to use the knife, very soon prefer it to any other. There is not only a variety of knives in the dressing rooms, but the system of killing may vary widely. For instance, both the bench and the string methods may be used



The Mammoth Incubator in use at Cornell University, U.S.A. **(see page 313)** [*Copyright.*

in the same packing house, and while some men will finish their birds out right the others will kill and rough the bird and then turn it over to a gang of tippers. Our observations would indicate that the quality of the output is increased when the rougher and pinner system is used and that it is also more economical than when the bird is finished by the rougher.

The cost in the west of piece-work varies from $2\frac{1}{2}$ cents on fowls and cocks to 3 cents on spring chickens and $3\frac{1}{2}$ to 4 cents on milk-fed poultry. There is an additional cost for the foreman, the head wiper and collector and the head wrapper, amounting to $5.00 per day. On the straight piece-work method it would cost, including the expenses of the foremen, the head wrapper and collector and head wiper, about $105.00 per day to dress 1500 head of fowl and cocks and 1500 head of milk-fed poultry. On the roughers and pinners basis it would cost about $94.00, a saving of approximately $11.00 a day. These figures have been obtained by actual observations in packing houses in different parts of the west operated on a practical basis. We believe that four good roughers can handle 3,000 birds a day. In the South, where the cost of labour is much cheaper, with the roughers and pinners system, including a foreman, a head wiper, and a head wrapper, the cost per day for 3,000 birds would be approximately $60.00. It will be observed that the system here outlined of roughers and pinners involves work by the roughers by the day or the hour, not by the piece. This plan has made far much better dressing than the straight piece method, even when the tipper is used to finish the bird.

SOME CHICKEN NOTES.

FOR the breeder who intends hatching in large quantities there is little doubt that the artificial method of rearing is the better, as broody hens are very scarce in the winter time. For those who wish to hatch a small number later on in the season hens are preferable. The feeding and general management in both cases is practically the same. Many old hands declare that anyone can hatch chickens, but it is a wise poultryman who rears them, and this is a true saying which has been borne out by many poultry-keepers.

Natural Rearing.

About the eighteenth day—that is, three days before the hen is due to hatch—she should be dusted lightly with insect powder, as nothing retards the growth of the youngsters more than the lice which they are liable to get from off the body of the hen. The hen should be fed before being put out in the coop with her brood, otherwise when the chicks have their first feed she will in all probability devour it. If the weather is damp or cold a floor should be fitted to the bottom of the coop and well covered with very fine peat moss litter. It is wisest to cover up the front every evening, as this will not only protect the chickens from cold winds and rain, but act as a safeguard against prowling vermin. Place the coop in a sunny position in winter and in a nice shady spot in summer. The old hen should always have free access to the drinking fountain, which should be just in front of the coop; in the summer time the fountain should be refilled once or twice a day, as sun-warmed water is most injurious. Move the coop daily, since nothing benefits the youngsters more than fresh grass. When they are about eight weeks old the hen is unable to brood them properly, and this in the winter time is the age when they should be removed to a small cold brooder.

For the first twenty-four hours of their lives it is quite unnecessary to give chickens any food at all, as preparatory to hatching they absorb the yolk of the egg, which sustains them for one or even two days of their existence. With their first feed should be mixed a little fine grit. There are two methods of feeding—namely, the dry and the wet—and both ways have strong advocates in many of our leading poultrymen. My own experience is that the best way is the happy medium or combination of dry and wet food. A few years ago for the first few feeds practically nothing else was used but hard-boiled eggs and bread crumbs, and there are still to-day a great many who prefer this method, although I am sure that if a referendum were taken on this question we should find that the majority were in favour of the dry food. Whilst on the subject of dry feed I should like to strongly impress upon all novices the great importance of purchasing their food from a reliable firm who understand the blending of the different seeds and know what should be put in and what should be left out; cheapness in nine cases out of ten is the dearest in the long run. Chickens when first hatched require feeding about every two hours for the first fortnight; at six weeks old five times a day is sufficient, twelve weeks four, and gradually diminishing to three.

At three weeks or a month old a little soft food may be given, and there are many excellent meals on the market. If preferred, ground oats, pinhead oatmeal, thirds, biscuit meal, mixed together and fed in a crumbly state answers the purpose just as well. A little pure meat meal may be added as the chicks get better, or, better still, if one has a good bone cutter, give them Nature's own food—green-cut bone, which they will quickly devour. Green-cut bone should only be given two or three times a week, and should be stopped when the birds approach maturity unless it is desired to bring them on to lay. The mid-day feed and the last one at night should consist of dry chick feed. At five weeks old the small feed hitherto used should give place to a mixture which consists of much larger seeds. A little charcoal and salt occasionally added to the soft food will be found very beneficial. Half-boiled rice and chalk are most useful for stopping diarrhœa. Lettuce, dandelions, nettles, etc., are all good and should be finely chopped up. Never overlook the importance of grit. Clean fresh water is also most essential.

EGG COOKERY.

The season having come round again when eggs are becoming plentiful, housewives may, perhaps, be glad to try some methods of cooking and serving them which are rather out of the common. It is a well-known fact that eggs contain more nutriment than almost any other article of diet with which we are familiar, and as they can be dealt with in such a variety of ways, all more or less dainty and attractive, there is no reason why one should ever grow weary of them. The subject has already been brought to notice in former issues of the *Illustrated Poulty Record*, but the following recipes will, we feel sure, prove entirely new, and we hope our readers will give them a trial.

Egg and Fish Toast: Almost any kind of fish may be used for this purpose, but anchovies or sardines are particularly good. Carefully remove the heads and tails, then pound the fish to a smooth paste; season this rather highly and moisten with a little fresh butter, then spread it on small slices of hot, well-buttered toast. Have ready at the same time the following mixture: Break half-a-dozen perfectly fresh eggs into a basin and beat them very lightly with a seasoning of salt and pepper, a tablespoonful of finely minced onion and a dessertspoonful of chopped parsley. Melt an ounce of butter in a small enamelled saucepan, and add to it three or four tablespoonfuls of milk and the beaten eggs. Stir constantly until the preparation begins to thicken, then pour it over the fish toast; arrange a few fillets of the fish crosswise on the surface, garnish round the edge of the dish with sprigs of parsley, or fresh pleasantly-seasoned watercress, and serve very hot.

Baked Eggs *(A Swiss Recipe):* Take the requisite number of pattytins, and, after buttering them well, cover the bottom of each with a layer of grated cheese, then add a large fresh egg which has been very carefully broken so as not to injure the yolk; sprinkle the eggs lightly with salt, pepper, and grated nutmeg, and pour a little cream over the tops. Sprinkle the surface with a mixture of grated cheese and finely minced parsley, and bake in a moderate oven from eight to ten minutes. When nicely set, turn each each egg out on to a crisply-fried, well-drained crouton of corresponding size, and arrange in neat order on a hot dish covered with a dish paper. Garnish with parsley and send to table at once.

Eggs and Tomatoes: Cut four large ripe tomatoes into quarters and one medium-sized Spanish onion into slices and put these into a saucepan with two ounces of fresh butter, a tablespoonful of chopped parsley. Salt and pepper to taste, and stir over a moderate heat until the ingredients are quite hot, then draw the saucepan on one side and allow the contents to cook gently for about a quarter-of-an-hour. Meanwhile, prepare the requisite quantity of hot buttered toast stamped out in rounds, and place these in readiness on a hot dish, then arrange a neatly-trimmed poached egg on each round of toast. When ready, stir the tomato mixture, pour it gently over the eggs, and serve.

A Fricasse of Eggs: Boil six eggs quite slowly for ten minutes, then when cool, remove the shells and cut the eggs in halves, or, if very large, in quarters. Prepare in the usual way three-quarters of a pint of thick creamy white sauce, and when it has boiled, stir into it, by degrees, a tablespoonful of chopped parsley, a dozen button mushrooms which have been partially cooked, and cut in quarters, and a teaspoonful of grated lemon rind. When these various ingredients are well blended, add the eggs, and allow the whole to just reach boiling point. Arrange neatly on a hot dish, pour the sauce over, garnish round about with quarters, or fancifully-cut slices of lemon and sprigs of fresh parsley, and serve very hot. Note: If a brown fricasse is preferred, good brown sauce, or rich brown gravy, sufficiently thickened with roux, may be substituted for the white sauce.

Eggs with Ham, (*A New Method*): Put two ounces of fresh butter into a stewpan and while it is slowly melting break six fresh eggs separately into a cup, then slip them carefully into a basin containing a quarter-of-a-pint of milk; season lightly with salt and pepper, pour them into the stewpan and whisk briskly until the eggs begin to set. Add three or four ounces of very prime lean ham cut in small dice, and continue whisking until the latter is quite hot. Have ready some skilfully-fried, well-drained cronstades of stale bread, and fill these with the egg mixture; place a slice of cooked tomato on the top of each, sprinkle very lightly with finely-chopped hot parsley, arrange neatly on a hot dish covered with a folded napkin, or fancy dish paper, and serve as quickly as possible.

A French Omelet: Break five or six perfectly fresh eggs very carefully, putting the yolks into one basin and the whites into another; stir the former until well-mixed, then season tnem pleasantly with salt and pepper. Add to them a tablespoonful of onion minced very finely, a dessertspoonful of chopped parsley, two ounces of slightly-warmed butter, two tablespoonfuls of grated cheese, and a little pounded mace, and mix thoroughly. Whisk the egg whites to a firm froth and stir this in as lightly as possible with the other ingredients. Have ready an omelet pan, or a scrupulously clean frying pan, containing a small quantity of hot butter; pour the egg mixture into this and fry the omelet in the usual way, then fold it over, slip it on to a very hot dish paper, and serve immediately.

Omelet Souffles: Prepare a mixture same as above, then pour it into a deep dish—an ordinary pie dish will answer the purpose if a proper soufflé dish is not available—which has been well-greased, and bake it in a well-heated oven until nicely set and just very lightly browned, when it is done enough. Wrap a hot napkin round it as quickly as possible, and serve at once. Or, if preferred, the mixture may be turned into a small cup, or dariol moulds, and be very gently steamed, in which case the soufflés should be turned out on to a very hot dish paper before being sent to table.

IRISH EGG LAYING COMPETITION. 1st OCTOBER—31st DECEMBER, 1912.

For some years the Department of Agriculture and Technical Instruction has been publishing egg records of ordinary farm poultry, and much useful information has been obtained from these returns.

During the past year, however, it was felt that the time was ripe for a fresh stimulus to the industry, and, accordingly, it was arranged to hold the first Irish Egg Laying Competition at the Munster Institute, Cork, where a permanent poultry plant was specially laid down for the purpose.

Situation. The site selected is a level strip of land which had never been used for poultry. The soil is very suitable, being a rich loam over limestone gravel, but there is no natural shelter.

The Runs. The runs are fifty-four in number, fifty-two being occupied by competition birds. Every pen of six pullets has a separate house and run, the size of the latter being roughly 12 yards by 10 yards, or twenty square yards of run to each bird. These runs are sown with a permanent grass mixture containing a good proportion of clover, and are at this date (31st December, 1912) quite green, as, owing to our moist climate, grass grows here practically all the year round.

Shelter. As the site of the runs is fully exposed to the prevailing west and south-west winds, it was deemed necessary to sheet the runs with boards on all sides to a height of 3 feet; above this boarding there are 4 feet of wire netting, making the fence a total height of 7 feet.

Houses. The houses are plain but substantial. The essentials striven for (*a*) a constant supply of pure air without exposure to draughts or driving rain; (*b*) a dry floor; (*c*) plenty of light.

The Size. The size of each house is 6 feet by 5 feet, and the whole floor space is available for scratching.

Concrete Foundations. Concrete foundations are used, the floor being sunk and then filled in with a good layer of dry earth (put in during dry summer weather), and over this earth plenty of litter is used. Although December has been an exceptionally wet and stormy month, these floors have given great satisfaction.

The houses are provided with shutters, which are closed on very wet and stormy days, and two large glass windows allow the pullets to take full advantage of the winter sunshine. These windows are movable so that they can be dispensed with in hot weather and the house made practically open-fronted.

Trap Nests. Trap nests are used throughout, three nests being fitted to each house. All doors open on the passage, as do the trap nests, so that untrapping, feeding, watering and cleaning can all be done without entering the runs.

The pullets arrived at the place of competition on 13th September, 1912, and the contest began on 1st October.

Breeds. The following are the breeds entered, and they give a fair indication of the popularity of the different utility fowls in Ireland:—

Breed.	No. of pens entered.
White Wyandotte...	12
Barred Rock	8
Rhode Island Red...	6
Buff Orpington	5
White Leghorn	5
Brown Leghorn	4
White Orpington	4
Red Sussex	3
Faverolles	3
Light Sussex	1
Minorca	1
Control Pen (Rhode Island Red) ...	1
Total ...	53

The 54th pen is used for broody hens.

See table at end for details.

Quality of Birds. Taking into account that this is the first competition held in Ireland, and that most of the competitors are novices at selecting birds for such a contest, the quality is very fair. There are, however, certain points to which the special attention of intending competitors in 1913-14 should be drawn:—

(1). The chances of some pens have been completely spoiled by too early hatching. As an example, a pen of White Wyandottes arrived with several of the pullets already laying; these looked like January birds, and three of them have now moulted, thus spoiling the chances of the remaining three, which have laid well all the time. Hatching even in February is a risk, although where such birds escape moult they do well in a winter test.

(2). Some of the pullets were so immature that had the test been for the winter months they would have had to be returned. Some were still in chicken plumage on arrival. One of these, a pen of Orpingtons, cannot have been more than four and a half months old. These began to lay in November, and in that month one of the pullets laid 26 eggs, repeating the performance in December. Had these birds been just a month older they

would have taken a high place in the winter test, as they are evidently an exceptionally good strain.

(3). A few of the pens were badly fed and were in extremely poor condition on arrival. No pen that looked poorly fed or rough in feather has done well. The question of feeding is of greater importance than any other point of management. The best breed or strain may be ruined by careless or improper feeding, although on the other hand suitable feeding will not transform a bad layer into a good one. The leading pens were all in splendid condition on arrival, and had evidently been carefully bred, reared and selected.

Foods. The foods used are oats, maize, wheat, pollard, thirds, bran, linseed meal, meat meal, cut clover, hay, cabbage, and milk. A supply of grit and shell is always available, and pure water is kept before the birds at all times, a supply being always kept both inside and outside the house. All grain is buried in litter, and soft food is given in the morning or at night, according to the state of the weather.

The Weather. The weather was fine in October. November brought a sharp spell of frost, and on five mornings the water inside the houses was found frozen. December was a most unpleasant

IRISH EGG-LAYING COMPETITION. *[By courtesy of the Irish Board of Agriculture.*

Houses and Runs—showing birds being untrapped and water being supplied from passage-way.

Health of Birds. Two pullets have died, but on the whole the health of the birds has been good.

Broodiness. Broodiness has been frequent in the Orpington, Sussex and Rhode Island Red pens, and in one pen of Wyandottes. When the pullet becomes broody she is at once removed to a house without nests, and four days later she is usually ready to return to her pen. Each very early pullet that went broody moulted.

month, a cold rain alternated with storms, and it was altogether a trying month for poultry.

The following table shows the position of the different breeds as regards number of eggs laid. The value is given in every case. During October, November and December every egg weighing 1 ounce 15 drams was counted a first grade egg, but on and after the 1st January, 1913, 2 ounces will be the minimum for this grade.

The eggs were all sold locally, and the value given represents the actual money received.

Details of Egg Production.

Order of Merit.	No. of Pen.	Breed.	Total No. of Eggs from Pen.	Total Value. £ s. d.
1	44	Red Sussex	296	1 19 2¾
2	31	White Wyandotte... ...	293	1 19 0¾
3	12	Buff Orpington	244	1 9 0¾
4	50	Rhode Island Red... ...	231	1 7 11
5	37	White Wyandotte	203	1 6 1¾
6	11	Buff Orpington	199	1 4 7
7	49	Rhode Island Red... ...	195	1 5 6¾
8	8	Brown Leghorn	191	1 4 4¼
9	52	Rhode Island Red... ...	189	1 5 6¼
10	47	Rhode Island Red... ...	188	1 4 9½
11	15	Buff Orpington	186	1 4 10¾
12	19	White Orpington	182	1 4 7¾
13	9	Brown Leghorn	176	1 2 10¼
14	13	Buff Orpington	173	1 1 8¼
15	1	Black Minorca	172	1 2 2¼
16	23	Barred Rock	164	1 1 3¼
17	33	White Wyandotte	162	1 0 7½
18	38	White Wyandotte	154	1 0 11½
19	6	White Leghorn	152	1 0 5¼
20	24	Barred Rock	149	1 0 5
21	35	White Wyandotte	144	0 19 6½
22	20	Barred Rock	139	0 18 7¼
23	22	Barred Rock	135	0 16 11
24	48	Rhode Island Red... ...	132	0 17 10¼
25	51	Rhode Island Red	129	0 17 8¼
26	34	White Wyandotte	127	0 16 8¾
27	10	Brown Leghorn	114	0 14 9¼
28	26	Barred Rock	111	0 13 6¼
29	42	Salmon Faverolle	107	0 13 7½
30	46	Light Sussex	105	0 13 6½
31	4	White Leghorn	98	0 13 5¼
32	2	White Leghorn	95	0 12 10¼
33	39	White Wyandotte	93	0 12 5¾
34	7	Brown Leghorn	92	0 12 5¼
35	36	White Wyandotte	91	0 11 10½
36	43	Red Sussex...	89	0 12 0½
37	18	White Orpington	89	0 11 7
38	5	White Leghorn	84	0 11 3¾
39	17	White Orpington	83	0 11 3¾
40	14	Buff Orpington ...	83	0 10 5
41	25	Barred Rock	71	0 9 8
42	32	White Wyandotte	71	0 9 5
43	30	White Wyandotte	68	0 5 0½
44	28	White Wyandotte	55	0 7 5
45	16	White Orpington	52	0 7 1½
46	40	Salmon Faverolle	51	0 6 11¾
47	3	White Leghorn	50	0 5 8¾
48	45	Red Sussex...	42	0 5 8¼
49	21	Barred Rock	40	0 5 3¼
50	29	White Wyandotte	35	0 4 7¼
51	41	Salmon Faverolle	33	0 4 4¼
52	27	Barred Rock	14	0 1 10
Control Pen.	53	Rhode Island Red... ...	202	1 7 2¾

We have received from Mr. and Mrs. Pyne, of Ravenscar, Yorkshire, a copy of their catalogue for 1913. The farm is 750 feet above the sea, situated midway between Scarborough and Whitby; the hardiness and vigour of their birds, therefore, needs no emphasising. It was in 1892 that Mr. and Mrs. Pyne commenced to apply the individual egg recording system, and its persistent use since that date has given them quite a unique experience in selecting, mating, and breeding for eggs. The catalogue contains full particulars of the various specialities of the farm and is well worth a careful perusal. It will be sent post free on application.

THE SPECIALIST CLUBS' YEAR BOOKS.

By William W. Broomhead.

THIS is the day of advertisement; and little can exist without it. To keep in line one must advertise; and the more attractive the advertisement can be made the more likelihood there is of its leading to good business. For the majority the Fancy is no longer a hobby. Look on it as such if you will, but in ninety-nine cases out of a hundred it is a business. The specialist clubs exist to run that business—to boom new varieties, to prevent old breeds from dropping out of the running, even to let the man in the street know that there are such creatures as cocks and hens and such bodies as poultry clubs. Business first—always. That must be the motto of the progressive club.

One of the very best forms of advertisement for these specialist societies is to issue an attractive year book and to send it broadcast throughout the land. It should free and post free. It is not always so; unfortunately, some clubs aim at making their publications paying concerns. Such, however, in my opinion is a cheese-paring policy. Just as a certain percentage of the funds must be expended in special prizes so should there be a figure set aside for advertising the club; and in no better way can this be done than by giving the year book to all who are in the least interested in the breed or variety for which the club caters. In the vast majority of instances each year book put into the hands of an outsider would result in that man becoming a member of the club.

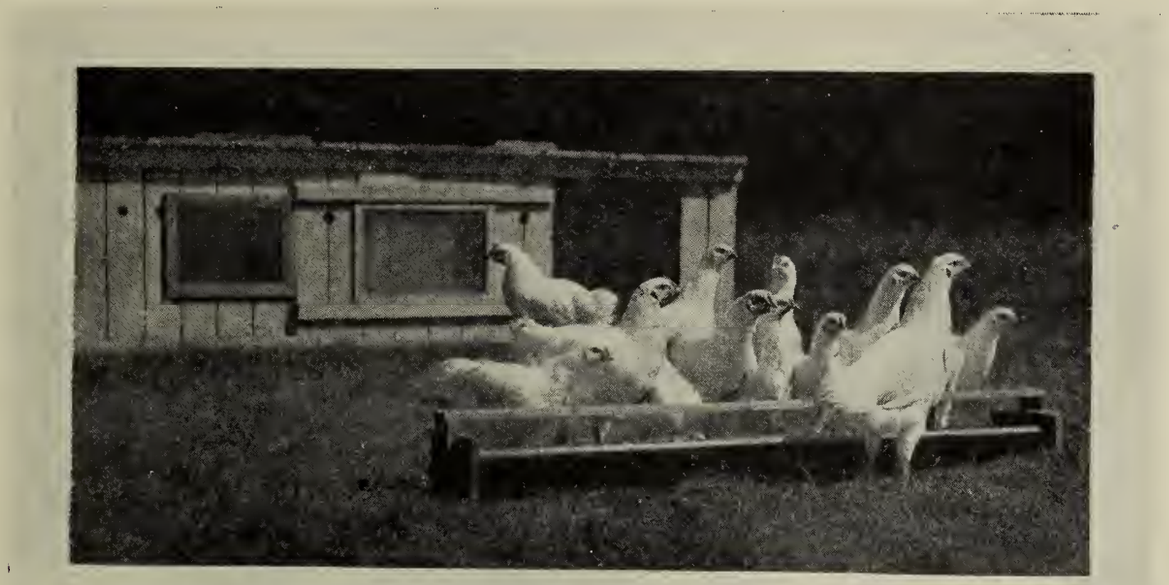
The publication of the usual year books has been somewhat delayed this season; after all, there is not much, if indeed anything, to be gained by having them ready on the first of January. Rather in fact should they be issued in spring, when the breeding season is in full swing. Of those that have been through my hands I give a brief mention.

The Barred Plymouth Rock Club; Hon. Secretary and Treasurer, Mr. A. A. Flemming, 7, Lyndhurst Road, Thornton Heath, Surrey. Until a few months since this club catered for all varieties of the breed, and it was known as the Plymouth Rock Club. Now, however, it fosters only the Barred, and its object is "to further the best interests of the Barred Plymouth Rock in every way"—in bantam form as well as fowl, it may be remarked. The year book, however, is disappointing, and particularly in view of the fact that the club is an influential body, and its hon. secretary a "live" one. It contains nothing beyond the usual cut and dried items—lists of officers and judges, challenge cup winners and members, rules, standards, balance sheet, brief reports of the club show by the judges, the annual report, and the president's letter, the only new feature being "Tit-Bits" by the hon. secretary. These are all of interest, no doubt, to members, but of little inducement to outsiders. As a matter of fact the book is nothing like

as useful as have been some of its predecessors, and I regret that I have to write of it as such. The balance in the bank at the end of the club year was £14 13s. 1d., more than fifty shillings in advance of that brought forward from 1911; so one would think that a few more pages could have been added to the year book to give articles likely to be of benefit to the beginner.

The Cuckoo and Blue Orpington Club: Hon. Secretary and Treasurer, Mr. Art. C. Gilbert, Swanley Poultry Farm, Swanley, Kent. This club has been in existence only a little more than two years, having been formed just prior to the Crystal Palace Show of 1910, hence great things must not be expected of it in the way of a year book. The present is the second issue, and it is a decided improvement on the first. Not only does it contain the usual items, but there is an article on Cuckoos by Mr. William H. Cook, one on Blues by Mrs. E. J. Clark (of Messrs. William Cook & Sons), a third on both varieties—"How they were first made, and how to make them now,"—by Mr. Art. C. Gilbert, and a full report and comments on the Club Show of 1912 by the judge—a comment on every bird exhibited at the event, whether the specimen gained a card or not, and such a report that has seldom if ever been attempted. The club has by no means a strong membership, and when the year book was issued it numbered thirty-five. But with a turnover of £16 10s. 6d. it showed a balance in hand of £4 15s., while it has no less than ten Challenge Cups for competition. The year book is issued free to all; and since a thousand or more copies have been printed and will be sent to every part of the country, it looks as though the secretary's hopes of making the club one of the strongest in the Fancy will be realised in the near future.

The Variety Bantam Club: Hon. Secretary and Treasurer. Major G. T. Williams, Burton Joyce, Nottingham. The Bantam Fancy is a strong one these days, and the Variety Bantam Club year book for the present season is in every way in keeping with it. It consists of fifty-eight pages of art paper within a dark blue cover, and with the club's title printed boldly in red. There are about twenty excellent illustrations, and with one exception they are half-tone reproductions from actual photographs, while such well-known specialists as Messrs. R. Fletcher Hearnshaw, F.Z.S., J. F. Entwisle, Rowland Butterworth, J. C. Preston, Alfred Darby, R. Scott Miller, and E. W. Davies contribute articles on different breeds and subjects. The list of members and their addresses, together with the names of the varieties of bantam they keep, makes a good feature, while not the least interesting part of the year book is the list of prize winners at the Dairy, Palace, Birmingham, and Club (York) Shows last year. From the balance sheet it is pleasing to note that the cash to the club's credit on September 30th 1912, was £24 3s., and that amount after including such a heavy item of expenditure as £26 16s. 3d. balance of loss on the club show of 1910.



A Flock of White Wyandotte Cockerels. [*Copyright.*
The property of Miss Owens, Swaffham, Norfolk.

La Bresse Club (England): Hon. Secretary and Treasurer, Mr. G. H. Caple, Manor Farm, Stanton Prior, near Bristol. This is the second year book issued by the Bresse Club, but unless I am much mistaken it is not as bulky as the one published last year. It is, however, a neat little book, the thirty-two pages being of art paper, and bound in a stiff cover. In addition to the usual items there is a "Foreword" by the hon. secretary, in which he announces that he has "promises amounting to £4 3s. towards two challenge cups, to be offered at

the club show." Mr. A. M. Theobald contributes an article on the breed—referring to the work of "the La Bresse" Club, by the way—and writes of it as being the very best layer and table fowl in existence, which is, perhaps, excusable in a year book. On thing he mentions is that while the birds love their liberty and will on free range cost very little to keep, they adapt themselves well to confinement and "make excellent subjects for the intensive system." This is, however, somewhat different from the remarks with which the following article concludes, viz., "But for goodness sake do not try for big returns from La Bresse kept in back-yards or small grass runs." This article, by Mr. C. E. J. Walkey, is printed without a heading, but the hon. secretary has given it one—"Feeding and Management of La Bresse." It deals with other matters: but in that part treating of feeding the writer mentions two or three proprietory articles, which I think is a mistake. The year book contains the standards which were issued in November, 1910, as well as a monograph of the La Bresse Poultry Breed, according to the decision made by the committee of the Bresse Club, in the full meeting held at Bourg-en-Bresse, on October 19th, 1904. It is illustrated by two full-page cuts, from photographs, of a White cockerel and a Black pullet, the former, however, showing the bird with decidedly red lobes! I may mention that the year book will be sent to non-members for six-pence post free.

The Scottish Wyandotte Club: Hon. Secretary and Treasurer, Mr. T. Hamilton, Greenside, Strathaven, N.B. This year book, which non-members can obtain for three-pence post free, is, without doubt, one of the very best ever published by a specialist club; and for the price it is really remarkable value. Small wonder that the president, Mr. George Hay, in his address, compliments the hon. secretary on the able manner in which he has edited the book, since it is one of which any club should feel justly proud. Such important subjects as the breeding of Silvers and Golds, of Partridges, of Whites, of Blacks, and of Columbians are dealt with in separate articles, and each is handled by a specialist, the writers being Messrs. F. Argo, J. Elliot Mein, A. S. Paxton, William Morgan, and W. Y. Jeeves. In addition to these valuable hints for beginners, there is a full reprint of the standards for Wyandottes as adopted by the Poultry Club, as well as the usual information incidental to publications of this nature. I see that the membership is quite a big one, there being no less than eighty names on the list.

The Black Wyandotte Club: Hon. Secretary and Treasurer, Mr. Kingsley Willett, The Romans, Southwick, Sussex. This is the usual art paper publication of the B.W.C.; and containing, as it does a black cover with the lettering, etc., in yellow and red, and a coloured plate, it is not surprising to find the cost of it amounts to about £18. As a matter of fact, as shown in the balance sheet, the 1912 year book cost £17 5s. to print, and only £6 7s. 1d. was realised for advertisements and sales. However, the issue is an excellent one and is a credit to the hon. secretary, who is also the editor. In addition to a good report of the club show by Mr. W. M. Elkington, the president's (Mrs. Herbert Bury) address, and the usual items, there are four articles. Mr. Fred Bayley, the assistant hon. secretary, suggests some steps that members should take to produce an awakening in the affairs of the club. Mr. J. Hale contributes "Some thoughts on Mating and Type," in which he says he is convinced that double mating will continue to be an absolute necessity to produce the best of each sex. Another member, over the non-de-plume of "Green and Gold," writes on "Heterodoxy?" regarding the question of undercolour in males for breeding pullets, and yellow legs in females for the production of exhibition cockerels, while the gist of the results obtained from his experiments is that single mating is a reasonable possibility provided a male can be obtained having sound undercolour and clear legs as a cockerel. Mr. J. Carlton Hunting also supports this single mating idea in a few notes on the subject, remarking that it is quite possible to breed both good cockerels and pullets from the same pen. The membership of the Black Wyandotte Club is a strong one, there being 109 names on the list. The year book is six-pence post free to non-members.

The Black Leghorn Club: Hon. Secretary and Treasurer, Mr Clifford Willison, Bubney, Whitchurch, Salop. The Black Leghorn has had a rather slack time of late, which invariably happens after a boom; but signs are not wanting that the breed has arrived once more, and this time it is likely to stay. The club is catering in an excellent manner for novices and new members, and since it continues to issue a good year book it should go ahead. In the present edition there is an article by Mr. Bert Kirkman, with a few suggestions to breeders, while Mr. Walter Hurst writes of Black Leghorn pullets, their advancement in 1912, and Mr. Joseph Eadson has something to say of the rose combed variety. The year book also includes the standards and other useful information, and copies can be obtained of the Hon. Secretary by non-members for 4d. post free.

The Brahma Club: Hon. Secretary, Mr. H. L. Popham, Hunstrete House, Pensford, near Bristol. The Brahma is an ancient breed, and the club is certainly not a new one. Nevertheless, its year book is decidedly a novelty, a veritable *edition de luxe* in fact as regards publications of this kind. The illustrations are actual photographs, while with one single exception they are of the birds as they posed before the camera, and without any touching up. These of themselves are excellent guides for the novice. As regards reading matter, the year book falls short of those issued by other clubs, since the only information it contains is a list of the officers and members, one of the winners at the club show, the balance sheet, and rules, as well as the president's (Mr. S. W. Thomas) address, and an appeal by the Secretary.

WORKING AN INCUBATOR.

IT is, of course, perfectly true that those whose production makes the bulk of the supply of English poultry—the farmers and cottagers—rely almost entirely upon the natural method of incubation, but it must be remembered that the individual output of these poultry-keepers is comparatively small: and it is also true that, when the production of a single establishment exceeds certain limits, it is found that recourse must be had to artificial appliances, otherwise the production is uncertain, unequal, and insufficient to sustain the importance of the undertaking. The modern farmer is fast losing the prejudices of an older generation, and machinery now occupies an important economic place in all departments of agriculture. The agriculturist of the new era, understanding something of the importance of poultry production, is acquiring a fuller realisation of the significance of the incubator in relation to his output; and it is probable that the usual equipment of the farms and small holdings of the future will as inevitably include an incubator as a churn or a separator. Meanwhile those who have specialised have shown the way, and these notes are for the information of those who would follow.

It is probable that most poultrymen (but by no means all) prefer to use hens when they are available, although the one-time stock objections to the use of machines no longer hold good in face of labour-saving and more efficient devices; but, however that may be, hens are not always ready when wanted, and a shortage is sure to occur some time during the season. In such circumstances he whose experience has been gained with incubators of reliable makes never hesitates to turn to the machines; and after all, apart from the responsibility, the actual work involved is a trifling matter for the methodical man.

Points in Selection.

In the selection of a machine the choice is wide enough to satisfy (if it does not puzzle) the most exacting, and the comparison of a dozen or more illustrated catalogues will convince the most sceptical that the good points outnumber the bad; and that, as in the matter of selecting a breed for egg production, the most that can be said impartially is that there is no best. The analogy may be carried further, and it may be said that in these days of keen competition it is only the fit that survive; but, having said this, the decision must remain with the intending purchaser, whose resolve to employ an incubator implies intelligence enough to select the most suitable.

Apart from the method of heating, whether by tank or warmed air—the selection of either of which must depend upon individual requirements—the means applied to the regulation of heat demand some consideration, and, just as there are two principal types of machines, so there are two principal types of automatic regulators—the bar thermostat and the liquid thermostat or capsule. Whichever is used, the result of the action is produced in practically the same way, and the principle involved in both is the same, viz.: the regulators depend for their action upon the heat of the hatching chamber. A good machine has a good regulator, and, having implied that most are good, the application is fairly general; and when once a machine has been thoroughly regulated in its new situation it will usually work better without undue subsequent interference. In this connexion the question of situation is naturally an important one, and experience tends to the conclusion that books of instruction are not always reliable in this particular.

The Incubator Room.

Although there may be no need for a specially constructed incubator house, it should be realised that a room in a dwelling house is not by any means ideal for the accommodation of such machines. The special requirements include the possibility of the maintenance of a fairly even temperature, a suitable system of ventilation without the introduction of draughts, and a sufficient stability of structure to reduce vibration to a minimum. If these conditions exist in a cellar, without the drawback of any excess of moisture, such a situation will be found more suitable than that of a chamber in a dwelling, or any place in a range of farm or out-buildings; but if a cellar fail to meet any of the essential conditions, it is if anything worse than other situations. Despite the great importance of stability, and an equal external temperature, the most vital requirement is that of a constant and sufficient supply of pure fresh air; in an ill-ventilated chamber the oxygen of the atmosphere is largely exhausted by the lamp, to the detriment of the living germs within the machine.

The Need for Cooling.

The actual quantity of oxygen requisite during embryonic development is not very great, but the supply must be constant; and it appears probable that no cooling of the eggs is actually required to ensure the mere fact of hatching, and it is likely that the chief importance of the daily airing consists in the increase rather than the maintenance of vital force. However that may be, it is an ascertained fact that due attention to the cooling process, and some regulation of its period, relative to other factors, ensures the hatching of a stronger batch of chickens than is otherwise obtainable; and the best results are secured by the greatest amount of cooling that is consistent with punctuality as regards the hatching date—which is finally ascertained by experience and correct judgment.

The above are among the most salient points involved in the successful operation of incubators, but there are innumerable details—mostly referring to individual machines—which are as a rule succinctly dealt with in the directions supplied by the several makers.

DUCKS FOR THE TEST VALLEY.

By A. Holmes.

THE country to the north of London has been marked off in the minds of agriculturists as the duck district, and although many farmers on the west side of Hampshire are giving more attention to fowls, the duck is altogether neglected. One can occasionally see a few Aylesburies round a mill here and there, but practically the whole of the beautiful Test Valley is duckless.

The Test is a fast running river fed by a constant succession of side streams, which derive their sources from the springs in the chalk. Its valley consists chiefly of rich water meadows, which are of great value to the farms now that the production of meat and milk has taken the place to a very large extent, of bread and malt. In scores of instances there are odd corners that are practically waste now, where the conditions are suitable for duck breeding.

Between Whitchurch and Longparish, celebrated with painters for its great natural beauties, there are several farms with land running down to the river, but it is a rare thing to see a duck here at all. The same may be said of the Wherwell district. Indeed the idea seems to be firmly planted in the minds of all the inhabitants that the only value of the river is the trout fishing, which lets at high rentals, while many of the side streams are adapted to the cultivation of watercress, and none better can be procured than that which is sent from Hurstbourne and Overton Stations. From Fullerton down to Romsey the Test is bordered on either side by farms, except for one or two intervals, where it runs through the grounds of some favoured mansion. It takes in side streams from Wallop, Locksley and other districts, streams of beautiful clear water from the range of chalk Downs that mark the southern boundary of Salisbury Plain, but it would be difficult to muster a couple of hundred ducks over all this wide area, an area, too, be it remembered, that has markets near at hand. Southampton, Southsea, and Bournemouth are all readily reached from any of the dozen railway stations in the Test Valley, while for the Wallop district there is the large garrison at Tidworth, able and eager to take any quantity of eggs and poultry. Of recent years several north country men have secured farms in this favoured district. Perhaps some day an agriculturalist from Bedford will arrive and show his astonished neighbours that in such surroundings there is money in ducks.

TABLE POULTRY CLUB.

A meeting of committee was held on Wednesday, 5th March, at the offices of White, Tomkins, and Courage, Ltd, Mark Lane. Mr. P. A. Farrer, the newly-appointed chairman of committee, presided. There were also present Messrs. J. H. Gilbert, D. Widdows, and J. Godwin Edwards. Mr. Henfrey, the hon. secretary, tendered his resignation owing to pressure of private work, which was accepted with regret, and on the motion of Mr. Widdows, seconded by Mr. Gilbert, a hearty vote of thanks was passed to him for his great services to the club. Mr. Wm. C. Slaughter was, on the motion of Mr. Farrer, seconded by Mr. Widdows, unanimously appointed hon. secretary in Mr. Henfrey's place, and promised, in reply, to do his best to deserve the honour done to him. Mr. J. Godwin Edwards was appointed Vice-Chairman of the club. Mrs. Baines was elected to fill a vacancy on the committee. There were twenty-eight new members added to the club, and their names duly enrolled. The hon. secretary was requested to write and remind members that the annual subscriptions were now due. It was decided to offer three prizes in each of three classes of 10s., 5s., and 2s.6d. for pure-bred pullets, cross-bred cockerels, and pure-bred ducks at the Horticultural Society's Show, to be held in July at the Botanical Gardens ; and to ask Mr. Wheeler, of Marden, Kent, to judge these classes honorarily. These classes would be open, but a special medal will be awarded for the best pair of chickens and the best pair of ducks belonging to members of the club. The secretary was instructed to interview the Dairy Show authorities with a view to getting space for table poultry classes, and to offer prizes for each of eight classes, for which a schedule was to be submitted, and report to next meeting. The next meeting will be held at the same place on Wednesday, April 2nd, at 2-30 p.m.—Wm. C. Slaughter, Hon. Sec., Table Poultry Club.

EARLY DUCKLINGS.

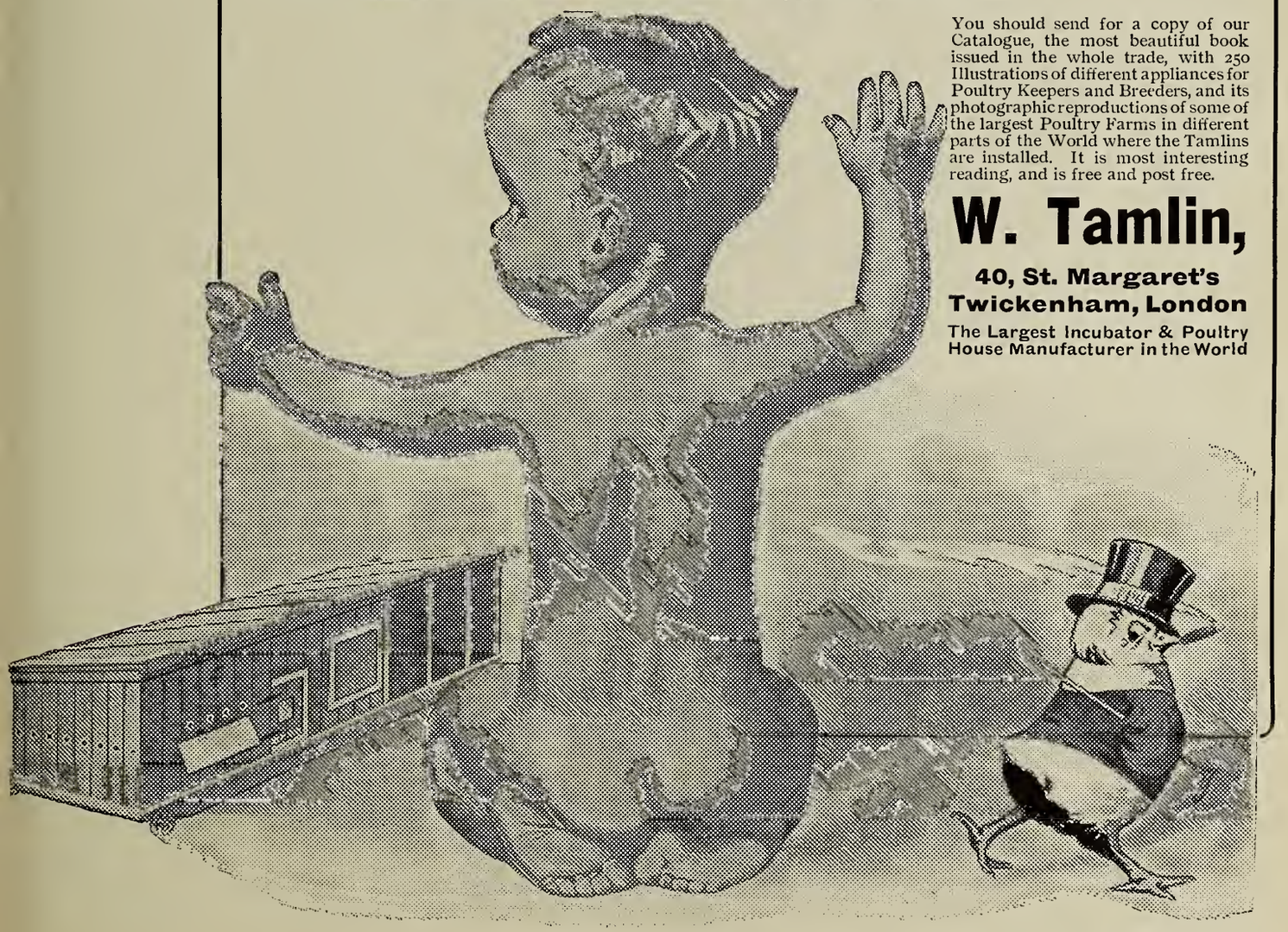
Considerable changes have taken place in this production during recent years, and the realisation of the fact that it is possible and profitable to breed and rear these birds in other districts than that of the original industry has resulted in a much more general output. One natural consequence of this widespread extension is found in the lowering of prices, and to the extent of the reduction of values the pioneer producers have inevitably suffered; nevertheless, the early trade is sufficiently remunerative to be encouraging to those who adopt suitable methods. The primary considerations concern the stock birds, as regards suitability of strain, hatching date, mating, and feeding. These are autumn considerations, to which the work of the preceding months—from the spring onwards—should have led up ; and the neglect of any essential factor is sufficient to account for a shortage of fertile eggs when they are required for the hatching of early ducklings. The stock birds that were hatched in due season of a good strain, and have been properly grown and duly mated (as they should have been by this time), now chiefly demand the attention of the poultryman in the matter of feeding. Although nitrogenous food is essential to a full supply of hatchable eggs, forcing must not be attempted and fattening ingredients must be eliminated.

LIKE NATURE'S WAY!

No one can improve on Nature's way of rearing chicks; she gives the chicks every condition necessary for their perfect development—her way is for them to breathe fresh cool air, and to get them warmed up by coming in contact with the warm body of the Mother Hen; not to breathe air that has become foul through the fumes of a lamp burning in the brooding chamber, consuming all the oxygen, and what little fresh air that generally is there; for the fresh air containing oxygen is the only real support of animal life, so very necessary for the development of health and growth. Foul air weakens the vitality, which means susceptibility to disease, eventually death. The air in the

TAMLIN'S CHICKEN REARER

is always cool and fresh because it is never confined, but always slowly changing—like the natural way—invigorating to the inmates, which means there is no smothering—no bowel complaint, and because of it the chicks are hardened off until their forces of resistance are equal to their out-door conditions of living. This cool fresh air is only made possible by the Tamlin plan of contact warmth—radiated on their backs by a hot-water copper tank all over the top of the brooding chamber. This warmth is genial and comforting to the chicks—same as they are warmed up by the Mother Hen when they come in contact with her warm body—it is absolutely a duplicate of the Mother Hen. The Tamlin Chicken Rearer is a fit companion for the Tamlin Incubator – satisfying Nature's every impulse—makes the Chicks feel at home—result—they grow like mushrooms.



You should send for a copy of our Catalogue, the most beautiful book issued in the whole trade, with 250 Illustrations of different appliances for Poultry Keepers and Breeders, and its photographic reproductions of some of the largest Poultry Farms in different parts of the World where the Tamlins are installed. It is most interesting reading, and is free and post free.

W. Tamlin,

40, St. Margaret's
Twickenham, London

The Largest Incubator & Poultry House Manufacturer in the World

TABLE OF PRICES REALISED FOR HOME, COLONIAL, AND FOREIGN POULTRY, GAME, AND EGGS FOR THE FOUR WEEKS ENDING MARCH 15, 1913.

ENGLISH POULTRY—LONDON MARKETS.

Description.	1st Week. Each	2nd Week. Each.	3rd Week. Each.	4th Week. Each.
Surrey Chickens ...	3/9 to 4/6	3/9 to 4/6	3/9 to 4/6	3/9 to 4/6
Sussex ,, ...	3/9 ,, 4/6	3/9 ,, 4/6	3/9 ,, 4/6	3/9 ,, 4/6
Boston ,, ...	3/1 ,, 4/0	3/0 ,, 4/0	3/0 ,, 4/6	3/0 ,, 4/0
Essex ,, ...	3/0 ,, 4/0	3/0 ,, 4/0	3/0 ,, 4/0	3/0 ,, 4/0
Capons	5/0 ,, 6/6	5/0 ,, 6/0	5/0 ,, 6/0	5/0 ,, 6/6
Irish Chickens	2/6 ,, 3/9	2/6 ,, 3/6	2/6 ,, 3/9	2/6 ,, 3/6
Live Hens.....	2/6 ,, 3/0	2/6 ,, 2/9	2/6 ,, 3/0	2/6 ,, 2/9
Ducks	3/6 ,, 5/0	3/6 ,, 4/0	4/0 ,, 5/0	4/0 ,, 4/9
Geese .....per lb.	— —	— —	— —	— —
Turkeys, English,,	/8 ,, /10	/8 ,, /10	/8 ,, /10	/7 ,, /10
Guinea Fowls	2/9 ,, 3/6	2/9 ,, 3/6	2/9 ,, 3/6	2/9 ,, 3/6

ENGLISH GAME—LONDON MARKETS.

Description.	Each.	Each.	Each.	Each.
Grouse	— —	— —	— —	— —
Partridges	— —	— —	— —	— —
Pheasants	— —	— —	— —	— —
Black Game.....	2/0 ,, 2/3	2/0 ,, 2/3	2/0 ,, 2/3	2/0 ,, 2/3
Hares.....	— —	— —	— —	— —
Rabbits, Tame.....	1/3 ,, 2/3	1/3 ,, 2/3	1/3 ,, 2/3	1/3 ,, 2/3
,, Wild	/9 ,, 1/0	/9 ,, 1/0	/8 ,, 1/0	/8 ,, 1/0
Wigeon	1/3 ,, 1/4	1/3 ,, 1/4	1/3	1/3
Teal	1/0 ,, 1/3	1/0 ,, 1/3	1/0 ,, 1/3	1/0 ,, 1/3
Wild Duck	2/9 ,, 2/9	2/6 ,, 2/9	2/3 ,, 2/6	2/3 ,, 2/6
Woodcock	2/6 ,, 3/0	2/6 ,, 3/0	2/6 ,, 3/0	2/6 ,, 3/0
Snipe	/9 ,, 1/6	/6 ,, 1/6	/9 ,, 1/6	/9 ,, 1/6
Golden Plover	/10 ,, 1/2	/10 ,, 1/2	/10 ,, 1/2	/10 ,, 1/2

ENGLISH EGGS (Guaranteed New-Laid).

Markets.	Per 120.	Per 120.	Per 120.	Per 120.
LONDON	11/0 to 12/-	11/0 to 12/0	9/0 to 10/0	8/6 to 9/6
Provinces.	**Eggs per dozen.**	**Eggs per dozen.**	**Eggs per dozen.**	**Eggs per dozen.**
CARLISLE	1/6	1/6	1/4	1/4
BRISTOL.....	1/5	1/5	1/4	1/2

FOREIGN POULTRY—LONDON MARKETS.

Countries of Origin.	Prices Realized during the Month. Chickens. Each.	Ducks. Each.	Ducklings. Each.	Geese. Per lb.	Turkeys. Per lb.
Russia .....lb.	/11 1/1	/9 —	— —	— —	— —
Belgium	— —	— —	— —	— —	— —
France.....	— —	— —	— —	— —	— —
United States of Americalb.	/11 1/0	— —	— —	— —	— —
Austria	— —	— —	— —	— —	— —
Canada	— —	— —	— —	— —	— —
Australia.....	— —	— —	— —	— —	— —

FOREIGN GAME. London Markets.

	Price Each During Month.
Capercailzie	— —
Black Game	— —
Ptarmigan	1/0 to 1/3
Partridges	1/6 to 1/9
Quail	— —
Bordeaux Pigeons	1/0 to 1/4
Hares	— —
Rabbits	— —
Snipe	— —

IMPORTS OF POULTRY AND GAME.

Month ending Feb. 28th, 1913.

Countries of Origin.	Declared Values. Poultry.	Game.
Russia	£98,410	£5716
France	£5,450	£18
Austria-Hungary	£9,335	£100
United States of America	£90,630	
Other Countries.....	£6.999	£7.991
Totals.....	£210,824	£13,825

IRISH EGGS.

Description.	1st Week. Per 120.	2nd Week. Per 120.	3rd Week. Per 120.	4th Week. Per 120.
Irish Eggs	10/6 to 11/6	10/6 to 11/6	10/6 to 11/6	8/9 to 10/0

FOREIGN EGGS.

Description.	1st Week. Per 120.	2nd Week Per 120.	3rd Week. Per 120.	4th Week. Per 120.
French ...	10/6 to 11/6	10/6 to 11/6	10/5 to 11/5	8/9 to 10/0
Danish ...	10/9 ,, 13/0	10/9 ,, 13/0	10/6 ,, 12/6	8/9 ,, 10/0
Italian ...	10/9 ,, 12/3	10/9 ,, 12/3	10/6 ,, 12/0	8/9 ,, 9/6
Austrian .	7/3 ,, 9/3	7/6 ,, 9/6	7/6 ,, 10/0	7/0 ,, 8/6
Russian...	— —	— —	— —	— —
Egyptian	6/3 ,, 6/9	6/3 ,, 6/9	5/6 ,, 7/0	5/0 ,, 6/0

IMPORTS OF EGGS.

Month Ending Feb. 28, 1913.

Countries of Origin.	Quantities in Gt. Hund.	Declared Values.
Russia.....	240,041	£98,696
Denmark	230,898	£136,872
Germany	52,682	£22,261
Netherlands ...	70,593	£38,694
France	47,993	£23,979
Italy.....	74,760	£39,178
Aust.-Hungary	97,100	£42,411
Other countries	362,330	£164,142
Totals	1,176,377	£523,233

RUSSIAN POULTRY INDUSTRY.

An interesting article in the Journal of the Russo-British Chamber of Commerce (St. Petersburg) states that on account of the partial failure of the harvest in 1911, the rapid growth which had been noticeable in the Russian poultry industry during the last five years received a check. There was a very sharp drop in the number of young birds in all the principal poultry-farming districts, many farmers selling the chickens for whatever prices they could get. As a result the prices of eggs rose rapidly, buyers complaining of the great shortage and the impossibility of purchase at the prices ruling—as much as 3 roubles (6s. 4d.) to 3 roubles 50 kopecks (7s. 4½d.) per hundred. On the other hand, the markets were flooded with poor underfed birds, and prices all the time kept falling. There was a considerable diminution of stock among poultry farmers while the industry suffered considerably from various forms of epidemics, against which little or nothing is done, and the profits were greatly reduced by the absence of organised sales, credit, co-operation, and cold stores. In spite of unfavourable conditions, the trade in poultry produce increased. Eggs, the chief product of poultry-farming, were carried by the Russian railways from the centres of production to the various home markets to the extent of 15,524,000 poods (pood = 36 lb.) in 1911, against 14,893,000 poods in 1910, and 13,522,000 poods in 1909. The quantities of poultry carried by the railways during the last four years were as follows (in millions of poods) :—

	1908	1909	1910	1911
Alive... ...	2·7	2·9	3·5	3·0
Dead... ...	828	850	1,218	1,107

In consequence of increased demand, both at home and abroad, the prices of poultry-farming produce increased in 1911 by nearly 30 per cent., due to the greater cost of purchase in the districts of production. The trade shows a tendency to run through more regulated channels, though the actual effect on results is little noticeable. From 80 to 90 per cent. still goes through intermediary buyers, and no serious attempt, except in districts of the Libau-Romny Railway, has been made to fatten the poultry for the market. A few more cold stores were started in the Governments of Voronej and Tambov, and those in Tchertkovo, Kozlov, and Ritshtev had a great deal more to do. Attempts at co-operative sales were noticeable in several districts amongst the small farmers, and special societies have been formed in a few places. A considerable increase has taken place in the exports of poultry produce during the last four years, as will be seen from the following table :—

	Eggs.		Poultry, Alive & Dead.	
	1,000 poods.	1,000 roubles.	In thousands.	1,000 roubles.
1908 ...	10,362	54,811	8,600	19,193
1909 ...	11,380	62,212	9,640	13,300
1910 ...	11,992	63,690	10,700	15,100
1911 ...	14,732	80,747	—	14,478

Down was exported to the value of 371,000 roubles in 1911, against 155,000 roubles in 1910, and feathers to the value of 1,485,000 roubles, compared with 1,384,000 roubles.

THE IRISH POULTRY INDUSTRY.

(*We refer to this in the Diary of the month*—Ed. I.P.R.)

The next associations to be considered are the co-operative poultry societies. They also are registered under the Industrial and Provident Societies Act. These societies collect eggs from their members, test, and grade them. Then they are packed in the most approved manner and marketed in Great Britain, either directly by the society or through the agency of the Irish Agricultural Wholesale Society. They also market chickens, geese, ducks, and turkeys. The number of societies engaged solely in this business is 18, the membership is 5,879, and the turnover last year was £62,897. The turnover of the agricultural and poultry societies does not, however, truly indicate the extent of the business done either in agricultural requirements or in the sale of poultry or eggs, because a large and growing number of dairy societies have extended their operations so as to include these in the work they undertake. The tendency is for a society which has become successful to take up new work. A dairy society will procure seeds, fertilizers, feeding-stuffs, and implements for its members, and act not only as a butter factory, but as an agricultural supply association, and sell the eggs and poultry of the members as well. The society which is successful in its first enterprise tends to become a general purposes society, and it is likely that in 25 years' time the entire agricultural business in every parish in Ireland will be carried on by one large well-managed association, which will buy, manufacture, and sell for its members. Such societies might have a turnover from of £50,000 to £100,000. They would be able to pay well for expert management, and the centralizing of a large number of petty farming and trading enterprises in a single large business concern could not but benefit agriculture. The estimate of such a trade for general purposes societies is not extravagant. Already some societies, trading both as agricultural and dairy societies, have turnovers of close on £40,000 annually. The turnover of a dairy society might be anything from £5,000 to £30,000; agricultural societies ought to average £5,000; poultry societies vary from £3,000 to £8,000; and if the sale of live stock, barley, flax, and other crops is finally included, together with the provision of credit for the members, the estimate made of the possible turnover would be soon passed. . . . . About £10,000 was usefully expended in improving the breed of poultry, and in encouraging bee-keeping. In the case of poultry, as in cattle, it was found either useless or undesirable to introduce any breed that would not thrive on sparing diet and in unfavourable circumstances as regards weather and housing.

[*Times*, March 17th, 1913.]

BROODER TEMPERATURE.

Where heated brooders are used it is important to know what is the right degree at which to start and keep. An interesting experiment is recorded by Mr. H. R. Lewis, B.Sc., in the annual report of the New Jersey State Experiment Station, with the object to determine—

First—The effect of an extremely high hever temperature on the per centage of mortality.

Second—The effect of an extreme variation in hever temperature, both ways from normal, upon the percentage of mortality.

Third—The most desirable temperature for best results.

Four brooders of the same pattern were used, in which two hundred chicks were placed, fifty in each, hatched on May 2nd, and the experiment extended over four weeks, during which time the control, except in respect to temperature, and feeding were the same.

Brooder No. 1 was started with a temperature of 110 degs. F., and a high average was maintained during the whole period, never falling below 106 degs., and sometimes rising to 118 degs. Twenty-one chicks died during the period, equal to a mortality of 42 per cent.

Brooder No. 2 was started at 102 degs. F., and wide extremes were run, varying from 86 degs. to 123 degs. F. Thirty-four chicks died, or a mortality of 68 per cent.

Brooder No. 3 was started at 100 degs. F., and kept constant for the first two days, after which it was lowered gradually about half a degree a day during the remainder of the period. Of these chicks five died, or a mortality of 10 per cent.

Brooder No. 4 was started at 90 degs. and kept for the first two days, after which it was gradually lowered one half a degree a day during the remainder of the period. In this instance twelve chicks died, or a mortality of 24 per cent.

The conclusions arrived at are as under:

(*a*) That an excessive high temperature continued for many days will weaken the vitality of the brood and cause a heavy mortality.

(*b*) That a wide variation in temperature, especially if the changes from one extreme to the other are rapid, will cause a large death rate, the deaths occurring at or immediately after the most extreme variations either way. *This factor of temperature variation is responsible for much of the mortality in artificial brooding.*

Fourth.—The experiment shows the most desirable hever temperature to be approximately as follows:—

First week	...	...	100 degs.
Second week	...	...	96 „
Third week	...	...	92 „
Fourth week	...	...	88 „

A good rule for desirable hever temperature is to keep the hever warm enough so that the chicks will spread out over the floor and not crowd. On the other hand it should not be hot enough to cause panting.

Fifth.—With Leghorn chicks it is not desirable to run the hever at a low average, as they attempt to keep warm by crowding, and much loss will follow, caused largely by suffocation and loss of vitality by a general weakened condition.

THE NORTHERN UTILITY POULTRY SOCIETY.

We have received a copy of the Year Book of the Northern Utility Poultry Society for 1912-13, a bulky volume containing about 100 pages. Full details are given concerning the working of the Club, and it emphasises the fact to which we have drawn attention on previous occasions, that this society is doing magnificent work in the North of England for the furtherance of the poultry industry.

The Year Book contains a great deal of information which is useful to the utility poultry keeper, as well as full details of the laying competitions which have been held since 1906. At the end of the book there is a useful feature, a series of monthly notes for poultry-keepers, telling exactly what should be done in order to obtain the best results from the fowls.

The Secretary of the Northern Utility Poultry Society is Mr. Charles Longbottom, 28, St. Matthew's Street, Burnley, one of the most hardworking of poultry enthusiasts, and it is to him that a great deal of the success of the society is due.

Half-days and Week-ends in the Country near London.

Those who wish to spend the business half-holiday, or better still the week-end, in the country will be attracted by the cheap travelling facilities offered by the Great Central Railway from Marylebone to the Chiltern Hills and Vale of Aylesbury. In this area is some of the prettiest and healthiest country near London. Walks and cycling runs abound in all directions, and the district is well covered with golf links of a good sporting character. These cheap facilities are clearly set forth in the A.B.C. Programme, which can be obtained free at Marylebone Station, G.C.R. Town Offices, or by post from Great Central Publicity Office, 216, Marylebone Road, London, N.W.

A Successful Scottish Farm.

Mr. Robert Miller, of the Stirlingshire Poultry Farm, Denny, Scotland, has favoured us with a copy of his new catalogue, a booklet consisting of 68 pages, well illustrated throughout, and containing full particulars of his stock and appliances. Mr. Miller is the largest combined poultry producer and poultry appliance maker in Great Britain, and during last season he hatched over 80,000 chickens. We had the pleasure of reviewing Mr. Miller's farm in our January issue, so that the particulars of the establishment are still fresh in the minds of our readers. We recommend those who are interested in poultry to write to Mr. Miller for his catalogue.

NORTH WALES EGG AND POULTRY DEMONSTRATION TRAIN.

April 23rd to May 6th, 1913.

ARRANGED JOINTLY BY

THE AGRICULTURAL ORGANISATION SOCIETY, Queen Anne's Chambers, Westminster, London, S.W.

THE NATIONAL POULTRY ORGANISATION SOCIETY, Queen Anne's Chambers, Westminster, London, S.W.

PROGRAMME.

Time Table.

Wednesday, April 23rd—

MOLD ... ... Arr. 4.18 p.m. Meeting 6 p.m.
(Held in Town Hall; Chairman: R. A. Yerburgh, Esq., M.P., President A.O.S. Lord Channing has promised to attend and speak.)

Thursday, April 24th—

RUTHIN ... ... Arr. 10.31 a.m. Meeting 11 a.m.
CORWEN ... ,, 12.31 p.m. ,, 3 p.m.
DENBIGH ... ,, 4.48 p.m. ,, 7 p.m.

Friday, April 25th—

RUDDLAN ... Arr. 10.4 a.m. Meeting 12 noon.
LLANRWST ... ,, 4.25 p.m. ,, 6 p.m.

Saturday, April 26th—

LLANFAIR ... Arr. 9.8. a.m. Meeting 11.30 a.m.
BODORGAN ... ,, 12.44 p.m. ,, 2 p.m.
HOLYHEAD ... ,, 3.29 p.m. ,, 5 p.m.

Monday, April 28th—

RED WHARF BAY Arr. 9.25 a.m. Meeting 12 noon.
LLANERCHYMEDD ,, 1.45 p.m. ,, 3 p.m.
AMLWCH ... ,, 4.0 p.m. ,, 7 p.m.

Tuesday, April 29th—

LLANGEFNI ... Arr. 8.49 a.m. Meeting 12 noon.
CARNARVON ... ,, 4.35 p.m. ,, 7 p.m.

Wednesday, April 30th—

PENYGROES ... Arr. 9.48 a.m. Meeting 12 noon.
PWLLHELI ... ,, 1.55 p.m. ,, 5 p.m.

Thursday, May 1st—

PORTMADOC ... Arr. 10.52 a.m. Meeting 12 noon.
HARLECH ... ,, 2.23 p.m. ,, 4 p.m.

Friday, May 2nd—

DOLGELLY ... Cars open 9 a.m. Meeting 11 a.m.
MACHYNLLETH ... Arr. 1.15 p.m. ,, 4 p.m.
LLANBRYMAIR ... ,, 5.15 p.m. ,, 6.30 p.m.

Saturday, May 3rd—

NEWTOWN ... Cars open 9 a.m. Meeting 11 a.m.
CAERSWS ... Arr. 12.32 p.m. ,, 2 p.m.
LLANIDLOES ... ,, 3.30 p.m. ,, 6 p.m.

Monday, May 5th—

WELSHPOOL ... Cars open 10 a.m. Meeting 2 p.m.
(Held in Town Hall; Chairman: Lord Boston, President North Wales Section of A.O.S. David Davies, Esq.. M.P., has promised to attend and speak.)

LLANFYLLIN ... Arr. 4.33 p.m. Meeting 6 p.m.

Tuesday, May 6th—

LLANYMYNECH ... Arr. 11 a.m. Meeting 2 p.m.

NOTE—Except where otherwise stated the Meetings will be held in the Station Yards.

SPEAKERS AND DEMONSTRATORS.

MR. EDWARD BROWN, F.L.S., Director.

*MR. WALTER WILLIAMS, Organiser for Wales of A.O.S.

MR. VERNEY CARTER, Chief Demonstrator.

*MR. DAVID THOMAS, Assistant Demonstrator, and others, inclusive of representatives of the Aberystwyth and Bangor Colleges of Agriculture and County Education Committees.

*Welsh Speaking.

Except during the time when Meetings are held, Mr. Edward Brown, F.L.S., and Mr. Walter Williams, will be in the Staff Saloon to give information respecting poultry questions generally and, also, the application of Co-operation to Marketing.

DEMONSTRATIONS, &c.

Two large railway vans will be used for demonstration. One of these will be fitted with modern poultry appliances, egg and poultry packing cases, diagrams and charts. In the other will be exhibited cases of eggs from various countries supplying the British markets, showing qualities of eggs and systems of packing, also specimens of the various grades of dead poultry will be displayed. Part of the car will be arranged as a room in which the testing of eggs will be demonstrated, as also grading. These cars will be thrown open to the public on arrival of the train as per Time Table.

Special facilities will be afforded as far as possible for older school children tovisit the Demonstration Cars. Applications should be made in advance by schoolmasters, stating probable number of scholars.

Sets of leaflets, some of which will be in Welsh, are being prepared and may be obtained in the Egg and Poultry Demonstration Train on application.

A representative of the Railway Companies will be in attendance to afford information as to rates, etc.

EXPORTATIONS.

William Cook & Sons' Exports,

Messrs. William Cook & Sons, Originators of all the Orpington fowls and ducks, of Orpington House, St. Mary Cray, Kent, have shipped the following to customers abroad during the past few weeks.

To Holstein, Germany, a pen each of Rhode Island Reds and White Leghorns, also of White Wyandottes. To Rio de Janeiro per McGrath & Co., a pen each of Barred Rocks, White Rocks, and Rhode Island Reds. Per R.M.S. "Briton," to Durban, a pen each of White Runner and Buff Orpington Ducks. To the Pyrenees, a Buff Orpington Cockerel. To the Loire district, a pen of Rouen Ducks, one of Barred Rocks, Black Orpingtons, and Silver Wyandottes. Per S.S. "Kono Maru," a pen each of Minorcas and Buff Orpingtons, to Colombo. To Moscow, four sittings of Blue Orpingtons, and twenty sittings of White Wyandottes. To Paris a Spangled Orpington Cockerel. To St. Petersburg, a White Orpington Cockerel. To Hamburg, a consignment of prize Buff and White Orpington Eggs. To St. Petersburg, a number of sittings of Black, Buff, and White Orpingtons. To St. John's, Newfoundland, eight sittings of various colours in Orpingtons, per Allan liner: and per Wells' Fargo Express three consignments of Blue Orpington eggs, to the United States. And per Parcel Post to British Columbia, champion White Leghorn eggs. To Arbat, Moscow, six sittings of Orpington and Wyandotte eggs. To Trinidad, Plymouth Rock and Buff Orpington duck eggs. To Berlin, four sittings of Orpingtons (repeat order after five years successive purchases). To Hungary, prize Buff Orpington eggs. To New York, four sittings of Blue Orpington eggs (repeat order from last season). To Rouen, a pen of Croad Langshan fowls, and Blue Orpington ducks. To Moscow, a pair of Blue Orpington fowls, and to Switzerland, six sittings of Langshan eggs.

Mr. Tamlin's Exports.

The following is a list of W. Tamlin's Exports, for February, 1913. Six 30, also six 60, and six 100 Incubators, to Mascarenhas & Co., Agents for Portugal; six 100, and twelve 60 Incubators, six 60, and six 60 Sunbeam Foster Mothers, to Woodhead, Plant & Co., agents for Cape Town, S. Africa; ten 30, also ten 60, and twenty-five 100 Incubators, twenty Hovers, and ten 100 Foster Mothers, to Fletcher Bradley, agent for Canada; three 100 Incubators, and three 100 Foster Mothers, to Georgian Agricultural Society, agents for Russia; one 60 Incubator, to Tangiers, order of Cooper, Pegler & Co.; one 100 Foster Mother, to Miss Annenkoff, Russia; twelve 60, also six 30, also six 100 Incubators, to J. F. Marshall, agent for the Transvaal, S. Africa; six 100 also six 60 Incubators, six 60 Foster Mothers, to Fernand Colman, agent for Belgium; one 60 Foster Mother, to Woolnough Ltd., Sydney, New South Wales; one 60 Incubator, one 60 Foster Mother, to Giovanni Barelli, agent for Italy; two 60 Sunbeam Foster Mothers, two 60 Incubators, to Treacher & Co., Bombay; one 200 Incubator, to E. Davies, Straits Settlements.

Packages for Poultry.

Lady Phillips calls attention in one of the South African papers to the unsuitability of packages in which poultry are transhipped, suggesting that the S.P.C.A. should give attention to this question. Occasionally the cubic space allowed may be too small. As a rule, however, exporters take care to do nothing that will prevent the birds being landed in good condition.

WILLIAM COOK & SONS

who are not only

ORIGINATORS OF ALL THE ORPINGTONS

but the largest Genuine Breeders of all classes of Poultry in the United Kingdom

All letters from the original firm of Cooks, bear above illustration of White Orpingtons.

Possess the largest flocks of profit-earning ducks in this country, every bird mated being typical, of fine colour and possessing unequalled laying qualities. They offer—

DUCK EGGS

BUFF ORPINGTONS: From winners at good shows—to produce ducks for keen competition per doz. £0 15 0

From good pure birds of perfect colour, from their special laying strains .. per doz £0 10 6

From birds of good colour, and equal to those in the other pens as layers .. per doz. £0 7 6

Their originators have the finest stock of this grand breed in this country. They are undoubtedly the duck of the future, as they lay nearly 200 eggs each yearly—and consequently ducklings can be produced all the year round—and they make as good table birds as Aylesburys

BLUE ORPINGTONS.—These ducks are as large as the biggest Aylesburys, and yet average 150 eggs each per year. From best pens of birds of perfect colour .. .. .. per doz. £0 10 6

From good pure stock .. per doz. £0 7 6

AYLESBURYS.—From massive, deep-keeled ducks, fit for keenest competition per doz. £0 15 0

From large birds and good layers per doz. £0 10 6

INDIAN RUNNERS.—From No. 1 Pen, containing birds fit for keenest competition per doz. £0 10 6

From Pen No. 2, containing ducks which are of fine type and excellent layers per doz. £0 7 6

WHITE RUNNERS.—A few of the choicest ducks of this breed are now mated at St. Mary Cray, and eggs can be supplied at .. per doz. £0 10 6

They can still supply Pens of CAREFULLY MATED BIRDS

Buff Orpingtons
White Orpingtons
Black Orpingtons
Jubilee Orpingtons
White Leghorns
Black Leghorns
Black Minorcas
Houdans
Barred Rocks
Croad Langshans
White Wyandottes
Partridge Wyandottes
Columbian Wyandottes
Indian Game
Speckled Sussex
etc., etc.

Consisting of six early pure-bred Pullets, from their guaranteed laying strains, producing 200 eggs each per year, with an unrelated Cockerel or 1911 Cock, £3 10s.

The same number of typical Pullets from their record layers, with a fine prize-bred Cockerel, of best type and good laying strains, £4 4s.

Also pens of typical, prize-bred birds to breed high-class fowls, £5 5s.

Also reliable Male Birds large-boned, vigorous, January and February hatched cockerels, of good type and colour, of all above breeds, at 21/- each; and well-bred January and February birds, which are fit for mating, and full of stamina and vigour, at 15/6 each; and large, useful, pure-bred birds at 12/6 each in all breeds except Indian Game, which are 15/6 each. Unrelated early pullets 10/6, and April ditto 9/6 each in all breeds.

They are also Breeders of every class of DUCKS, GEESE and TURKEYS, and prices will be sent on requirements being mentioned.

Quotations for birds in single numbers or more will be sent per return of post if inquirers will kindly mention their requirements.

TERMS:—All stock sent on approval in the United Kingdom. Cash to accompany order—this being returned if the birds are not satisfactory.

EGGS FOR SITTING.

These can now be supplied from following and many other breeds—

Buff Orpingtons	**Houdans**
White Orpingtons	**Barred Rocks**
Black Orpingtons	**Croad Langshans**
Spangled Orpingtons	**White Wyandottes**
Jubilee Orpingtons	**Partridge ,,**
White Leghorns	**Columbian ,,**
Black Leghorns	**Rhode Island Reds**

Speckled Sussex, etc.

of Challenge Cup Strains, 15/- per doz. From Prize Strains, which combine also good laying qualities, 10/6 per doz. From Pure Birds of their special Laying Strains, 6/6 per doz.

BLUE ORPINGTONS.

From their Palace 1912 winners, guaranteed .. .. ..per doz. £2 2 0

From Dairy and Palace winners ,, £1 10 0

From Sound Blues, winners at minor shows .. .. ..per doz. £0 15 0

The Headquarters for the finest day-old chicks in this country.

These can now be supplied :—

Black Orpingtons
Buff Orpingtons
White Orpingtons
Barred Rocks
White Wyandottes
Partridge Wyandottes
Rhode Island Reds
Houdans
Speckled Sussex
White Leghorns and
Black Leghorns

From birds of good type and colour, and large eggs .. doz 12s 6d.

From their prize pens, containing birds of finest type and colour, combined with good laying qualities per doz. .. £1 1 0

From Challenge Cup pens :—

Black Orpingtons
Buff Orpingtons and
White Orpingtons

£2 2s. per dozen.

Blue Orpingtons ... £4 4s. per dozen.

Safe Delivery at every Station guaranteed.

Will readers of "I.P.R." kindly note that the only address of THE OLD ORIGINAL FIRM—who have no connection whatever with any Limited Liability Company—is

ORPINGTON HOUSE, ST. MARY CRAY, KENT.

TELEPHONE: 7, CRAY.

Foreign and Export Orders executed daily. *All Risks taken in transit by them.*

Free copies of April and March "Poultry Journal" sent by mentioning this paper. Readers are referred to W. Cook & Sons Exports in this issue.

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